THUNDERBIRD
SCHOOL OF GLOBAL MANAGEMENT

HBP# TB0748

A03-24-0015

Tom Hunsaker
Abdulaziz Alakeel

Reimagining a Tech Giant: The IBM Digital Transformation Blueprint

"The only way you survive is you continuously transform into something else. It's this idea of continuous transformation that makes you an innovation company."[1]

— Ginni Rometty, IBM's Former CEO

In the early 2000s, International Business Machines Corporation (IBM), a giant in the global technology landscape, found itself at a crossroads. The tech industry was rapidly evolving, and IBM found its traditional hardware and mainframe businesses threatened by the rise of cloud computing and the proliferation of agile, cloud-based companies. As IBM watched its revenue streams stagnate and its technological dominance be challenged, the company faced major decisions: how to adapt to the new technological and services landscape or risk becoming obsolete.

The turn of the millennium marked significant shifts in the tech industry. The rapid advancement of cloud computing and the exponential growth of the internet had redefined competition and customer expectations. Companies like Amazon Web Services and Salesforce led the charge, offering scalable and cost-effective cloud-based solutions that contrasted sharply with IBM's heavy, on-premise installations. This new breed of technology firms not only challenged IBM's traditional business models but also captivated its customer base with its innovative solutions.

Could IBM reinvent itself to thrive in a digital age dominated by cloud computing and ever-evolving technologies? If successful, what could be learned from the firm's actions to inform future decisions?

IBM's Legacy: Pioneering Hardware and Tailored Software Solutions

IBM's ascendance in hardware began in the early 20th century with innovations that significantly advanced business data processing capabilities. One of its earliest achievements was the IBM 601, a punch card machine introduced in the 1930s. This innovation allowed businesses to process data more efficiently, laying the groundwork for IBM's future dominance in the computing industry. The real game-changer, however, came in the 1950s with the development of the IBM 701, the company's first mainframe computer. The IBM 701 marked a major technological breakthrough, providing businesses with unprecedented computational power and reliability.

The 1960s saw IBM further strengthen its position as a leader in hardware with the introduction of the IBM System/360. The System/360 revolutionized business computing by standardizing the hardware industry, allowing software written for one System/360 model to run on another without modification. This innovation not only provided businesses with flexibility and scalability but also set a new industry standard for computing.

Throughout subsequent decades, IBM continued to lead the hardware market with significant advancements in data storage. In the 1970s, IBM introduced the floppy disk, a milestone in data storage technology that became a ubiquitous tool for personal and business computing. IBM's innovations did not stop there; the company later made significant advancements in hard disk technology, further solidifying its position as a leader in data storage solutions. IBM's prowess extended into the supercomputing domain as well, where its machines

frequently topped the list of the world's fastest supercomputers, showcasing their ability to handle massive computational tasks and complex data processing requirements.

Alongside its hardware achievements, IBM also excelled in creating custom software solutions tailored to the specific needs of large businesses and organizations. One of IBM's notable software developments was IBM OS/2, an operating system developed in the late 1980s as a joint project with Microsoft before it became an IBM-centric project. IBM also developed a range of enterprise software solutions across various domains, including database management, collaboration, and enterprise resource planning. These software solutions were closely integrated with IBM's hardware offerings, providing customers with cohesive, customized solutions that optimized the performance and utility of IBM's products.

This synergy between hardware and software solidified IBM's position in the market, allowing it to offer unique, comprehensive solutions that were difficult for competitors to match. IBM's hardware products, including its mainframes and personal computers, had been the bedrock of its business model. The company's approach was deeply integrated, offering clients not just hardware but a suite of made-to-order software solutions and a range of professional services designed to maximize the functionality and performance of their installations. This model allowed IBM to secure a significant market share and forge strong client dependencies that were difficult for competitors to disrupt.

However, the rapid evolution of the technology landscape in the early 2000s, characterized by the growing popularity of cloud services and Software as a Service (SaaS) models, posed a significant challenge to IBM's traditional operations. Customers increasingly sought solutions that were flexible, scalable, and cost-effective, which changed the market from heavy, on-premise hardware installations toward cloud-based services. This change in customer demand prompted the need for IBM to transition from its traditional hardware-centric business model to a more service-oriented approach, aligning with the emerging trends and technologies that were shaping the future of the industry.

In response to these market dynamics, IBM recognized the need to evolve its business model to remain competitive and relevant in an increasingly digital world. This realization set the stage for IBM's comprehensive digital transformation strategy, aimed at leveraging its deep technological expertise and customer relationships to offer a new generation of services that would meet the changing demands of businesses globally.

Strategic Imperative for Transformation

Historically, IBM's revenue streams were bolstered by the sale of mainframe computers and other hardware products, which commanded high margins and fostered long-term customer relationships through maintenance and support services. The company's approach was deeply integrated, offering clients not just hardware, but a suite of custom software solutions and a range of professional services designed to maximize the functionality and performance of their installations. This model allowed IBM to secure a significant market share and forge strong client dependencies that were difficult for competitors to disrupt.

IBM's need to evolve from a product-centric to a service-oriented company was primarily driven by three major industry changes. The turn of the millennium introduced the era of cloud computing—a paradigm shift that promised greater scalability and flexibility at a reduced cost. Companies like Amazon Web Services (AWS) were at the forefront, redefining the market with cloud solutions that offered businesses the agility to scale without the substantial upfront investments associated with traditional on-premise hardware. As the digital landscape evolved, the early 2000s marked a significant shift with the emergence of service-oriented architectures (SOA). This paradigm championed a move away from monolithic, on-premise systems to more modular, network-based services that promised greater scalability, flexibility, and cost-effectiveness.

The rise of cloud computing further accelerated this trend, enabling businesses to reduce capital expenditures on IT infrastructure by leveraging shared resources offered via the internet. SOA's appeal was its ability to break down complex processes into simpler, interconnected components that could be easily integrated and scaled according to business needs. This architectural shift aligned with growing market pressures for agility and innovation, pushing companies to reconsider their IT strategies. Major tech contenders and new entrants began to capitalize on these demands, offering versatile, cloud-based platforms that significantly lowered the barrier to entry for scalable IT solutions.

Danny Sabbah, Former Cloud CTO at IBM, shared IBM's hybrid strategy model, said:

> *"Our hybrid strategy is fundamentally based on re-architecting and reorienting digital supply chains and digital value chains in an open environment that leverages cloud as a delivery mechanism."*[2]

He also added:

> *"One of the unique differentiators in our approach to the whole cloud message is really around the notion of digital transformation."*[3]

Simultaneously, customer expectations were evolving. Global enterprises increasingly sought integrated solutions that offered not just hardware but a blend of services including customization, real-time support, and scalability. The change was toward comprehensive service packages that could adapt to rapidly changing business environments and technological advancements—needs that IBM's product-heavy approach was becoming less equipped to fulfill effectively. Customers were no longer content with merely purchasing high-end hardware; they demanded holistic solutions that could provide immediate value, flexibility, and support. This change introduced the importance of moving beyond product sales to fostering ongoing service relationships.

Amid these changes, IBM also faced mounting competitive pressure from more agile companies that had embraced service-oriented models. These competitors operated with lower overheads and could implement solutions faster than IBM's traditional setups allowed. This agility enabled them to capture market share by aligning more closely with the growing demand for flexible and cost-effective IT solutions. Competitors like Google Cloud and Microsoft Azure not only provided scalable cloud services but also offered robust ecosystems of services that enhanced their overall value proposition. These companies were not burdened by legacy systems, allowing them to innovate swiftly and deploy new solutions at a pace that challenged IBM's traditional operational models.

Confronted with these realities, IBM recognized the urgent need to reimagine its approach. The company's strategic imperative was clear: transition from product-centric to service-oriented. This was not merely a response to market pressures but a strategic move to align with the future direction of the technology industry. IBM's leadership understood that to remain competitive and retain its market edge, it had to evolve, leveraging its deep technological expertise and customer relationships to offer a new generation of services that would meet the changing demands of businesses globally. This transition required IBM to invest in new technologies, restructure its business units, and fundamentally change its approach to delivering value.

IBM's Investment in Technology and Business Unit Restructuring

As IBM embarked on its ambitious digital transformation journey, it became imperative to realign its financial resources and organizational structure to support its new strategic direction. This phase of transformation focused heavily on investing in cutting-edge technologies and restructuring business units to drive innovation, efficiency, and growth. Recognizing that staying competitive required substantial investment in emerging technologies, IBM focused on several key areas.

A pivotal aspect of IBM's transformation was its significant investment in hybrid cloud solutions, which became central to its strategy for remaining competitive in the evolving technology landscape. The acquisition of Red Hat in 2019 for $34 billion, one of the largest technology acquisitions at the time, played a foundational role in IBM's hybrid cloud strategy. Red Hat's OpenShift platform provided IBM with a robust, enterprise-level Kubernetes container management solution. This was critical for deploying and managing cloud-native applications across various environments, including on-premises, private, and multiple public clouds. This capability enabled IBM to offer clients a flexible and consistent platform for cloud-based applications, addressing a major challenge businesses faced in digital transformation: managing workloads across diverse IT environments. Red Hat's commitment to open-source principles aligned well with IBM's strategy of fostering innovation and collaboration within the broader tech ecosystem. The synergy between IBM's enterprise reach and Red Hat's open-source leadership enabled IBM to cater to a broader spectrum of clients, from traditional enterprises modernizing their IT infrastructure to cloud-native companies requiring cutting-edge solutions.

Ginni Rometty, IBM's then-Chairman, President, and Chief Executive Officer commented on the acquisition:

> *"The acquisition of Red Hat is a game-changer. It changes everything about the cloud market."*[4]

The integration of Red Hat into IBM's portfolio was a strategic move to enhance its cloud capabilities. By combining Red Hat's open-source solutions with IBM's existing offerings, the company strengthened its position in the cloud-native applications market, enabling more flexible and scalable IT solutions for its customers. IBM also restructured its sales and marketing functions to better align with its focus on cloud and cognitive solutions, fostering a more customer-centric approach and enhancing collaboration and efficiency across its global markets.

Arvind Krisha, Senior Vice President, IBM Hybrid Cloud emphasized:

> *"IBM is committed to being an authentic multi-cloud provider, and we will prioritize the use of Red Hat technology across multiple clouds. In doing so, IBM will support open source technology wherever it runs, allowing it to scale significantly within commercial settings around the world."*[5]

IBM placed significant emphasis on artificial intelligence (AI) to drive its digital transformation, centering on IBM Watson, an AI platform renowned for its capabilities in data analysis, machine learning, and natural language processing. The introduction of applications such as Watson Assistant and Watson Studio enhanced business capabilities in customer service and data science. The development of the Cognitive Supply Chain Advisor 360, an AI-driven solution, marked a leap in supply chain management, offering real-time visibility and predictive analytics.

In response to the rising prevalence of cyber threats, IBM escalated its investment in security technologies. The deployment of IBM Security QRadar, a premier security information and event management solution, facilitated real-time threat detection and response. The IBM Cloud Pak for Security integrated multiple security tools to provide comprehensive insights and automated responses, supporting IBM's commitment to a zero-trust security model.

IBM also committed to harnessing the power of big data, implementing advanced data analytics technologies. IBM Cognos Analytics, an AI-enhanced business intelligence platform, enabled self-service analytics and data visualization, turning raw data into valuable insights. IBM Db2, an AI-infused data management system, supported enhancements in data integration and governance for data lakes and warehouses.

To drive innovation across various sectors, IBM utilized the Internet of Things (IoT). The IBM Watson IoT Platform linked devices and data, applying advanced analytics and AI to generate actionable insights. IBM Maximo used IoT for comprehensive asset management, optimizing operations and enhancing productivity through advanced asset lifecycle management.

IBM's strategic foray into blockchain technology emerged as a transformative component of its broader digital modernization efforts. Recognizing the potential of blockchain to enhance transparency and efficiency across diverse sectors, IBM developed the IBM Blockchain Platform, which was designed to support varied cloud environments, including its own IBM Cloud, Amazon Web Services, and on-premises data centers. This adaptability ensured that businesses could employ blockchain without the risk of vendor lock-in, while enhancing operational agility and security. As the platform gained traction, it found applications across multiple industries, streamlining transactions and underpinning new standards for business operations in finance, supply chain management, and beyond.

IBM's transformation extended beyond technology investments to include a significant restructuring of its business units, aligning with new strategic priorities. The establishment of the Cloud and Cognitive Software division marked a strategic shift toward delivering integrated cloud services and AI-powered software solutions. IBM Consulting, formerly Global Business Services, fostered an open ecosystem and collaborative innovation, securing IBM's position as a crucial partner for clients engaged in navigating digital transformations.

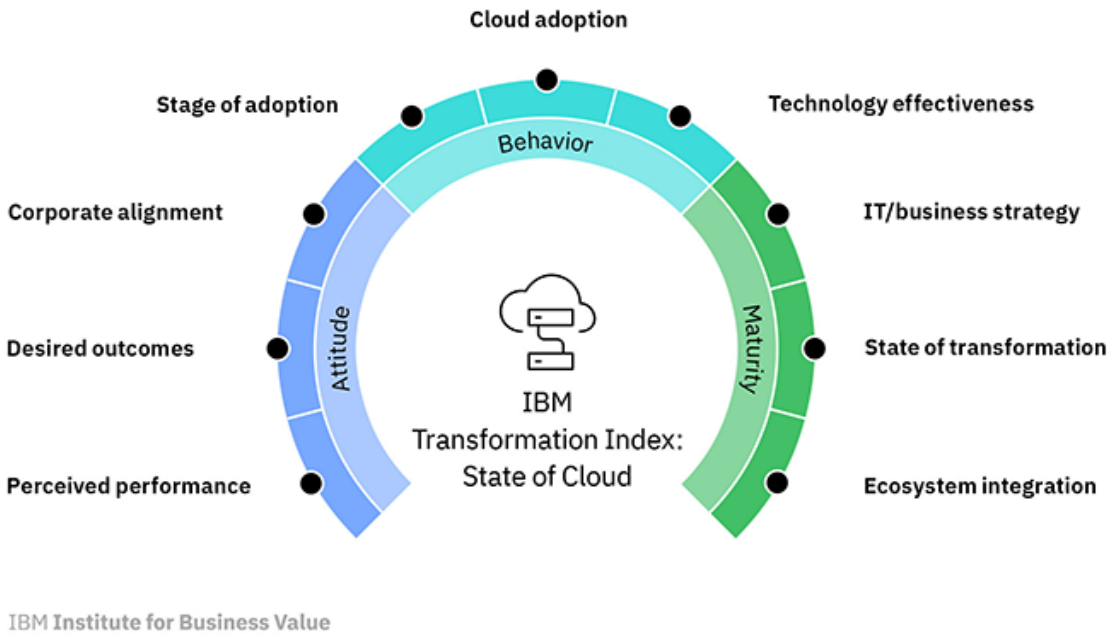
In a move reflecting its strategic pivot toward a software and services-centric business model, IBM sold its Personal Computing Division to Lenovo in the early 2000s. This decision marked a significant shift in IBM's focus, aligning with its broader objectives to navigate away from the increasingly competitive and low-margin hardware sector toward higher-value technology services and solutions. The transaction, valued at approximately $1.75 billion, was structured with both cash and Lenovo stock, making IBM a major shareholder in the Chinese firm, with 18.9% equity in Lenovo. This sale included the iconic ThinkPad laptop line, positioning Lenovo to expand its global reach in the PC market while allowing IBM to concentrate resources on emerging areas like cloud computing and artificial intelligence.

Samuel J. Palmisano, Former Chairman and Chief Executive Officer, IBM commented on the acquisition:

> *"Over the past several years, we have aggressively repositioned IBM to be the world's leading provider of innovation-enabled solutions for businesses and institutions of all sizes, in all industries. This requires single-minded focus on the business client and significant ongoing investments in R&D and the creation of intellectual capital."*[6]

IBM's digital transformation involved a strategic pivot toward new technologies and a comprehensive restructuring of its business units. By investing in hybrid cloud solutions, AI, security, data analytics, and IoT, and by creating new divisions, integrating Red Hat, realigning global markets, focusing on skills development, adopting agile methodologies, and integrating new business models, IBM positioned itself to lead in the digital age. These changes not only enhanced IBM's operational efficiency and service offerings but also ensured that the company remained competitive in an increasingly dynamic and technological landscape.

Exhibit 1. IBM Transformation Index



Source: https://www.ibm.com/thought-leadership/institute-business-value/en-us/report/transformation-index

Embracing a Digital-First Strategy

In embracing a digital-first strategy, IBM anticipated several transformative benefits that would reposition the company at the forefront of the technology sector. This shift was expected to significantly enhance IBM's agility, enabling the company to respond more swiftly to market changes and evolving customer needs. By focusing on cloud computing, artificial intelligence, and blockchain technologies, IBM aimed to develop more customer-centric solutions, fostering deeper engagement and satisfaction. The integration of these advanced technologies promised to streamline operations, reduce costs, and opennew revenue streams. Moreover, adopting a digital-first approach was seen as a critical move to outpace competitors who were rapidly gaining ground with flexible, scalable services. This strategic pivot was intended not only to modernize IBM's product offerings but also to align the company's operations with the demands of the 21st-century digital landscape, thereby securing its market leadership and long-term sustainability.

IBM's strategic goals for expanding its service offerings were centered on leading the market in cognitive solutions and cloud platforms. The company aimed to leverage its strengths in artificial intelligence, particularly through IBM Watson, to provide advanced cognitive solutions that could revolutionize various industries by enabling more intelligent and automated decision-making processes. In the realm of cloud computing, IBM

sought to offer robust, scalable, and secure cloud platforms that would cater to the evolving needs of businesses globally. This strategic focus was expected to not only enhance IBM's competitive edge but also to drive substantial growth by tapping into the burgeoning demand for cloud and AI-driven services. By positioning itself at the forefront of these technologies, IBM aimed to foster innovation, improve operational efficiencies for its clients, and create new revenue streams, thus ensuring sustained leadership in the rapidly evolving tech landscape.

Early Transformation Phase: Cultural Shifts

In the early phase of its digital transformation, IBM recognized that aligning its corporate culture towards innovation and agility was crucial for success. This realization led to the implementation of several key strategies aimed at fostering a more dynamic and responsive organizational culture.

One of the primary strategies was the establishment of the IBM Garage Methodology. This approach emphasized a collaborative environment where cross-functional teams could innovate and iterate rapidly. The methodology focused on co-creation with clients, encouraging a culture of continuous feedback and improvement. This shift was designed to break down traditional silos within the organization, promoting a more integrated and agile approach to problem-solving and product development.

Recognizing the importance of reskilling and upskilling its workforce as a key component of its transformation strategy, IBM launched several initiatives to foster a culture of continuous learning and adaptability. Initiatives such as "Think Academy," "IBM SkillsBuild," and "Your Learning" provided personalized learning paths and resources in critical areas like AI, cloud computing, and cybersecurity. These initiatives equipped employees with necessary skills to manage new technologies and fostered a mindset geared toward innovation.

Leadership played a crucial role in this cultural change. Senior executives, including then-CEO Ginni Rometty, were actively involved in championing the transformation initiatives. They communicated a clear and compelling vision of the future, emphasizing the importance of agility and customer-centricity. Leaders modeled the desired behaviors, demonstrating a commitment to transparency, collaboration, and a willingness to take calculated risks. This top-down approach was vital in building trust and securing buy-in from employees across all levels of the organization.

IBM also restructured its organizational framework to support more agile ways of working. The company adopted a flatter organizational structure, reducing hierarchical layers to enable faster decision-making and greater empowerment at all levels. This restructuring was complemented by the introduction of new performance metrics that aligned with the goals of digital transformation. Metrics such as innovation output, speed to market, and customer satisfaction became central to evaluating success, replacing traditional measures that focused primarily on efficiency and cost control.

To reinforce these cultural changes, IBM celebrated early successes and recognized contributions that exemplified the new cultural values. Success stories were widely communicated throughout the organization, serving as inspiration and demonstrating the tangible benefits of the new approach. Recognizing and rewarding innovators and early adopters helped to embed the desired behaviors into the organizational fabric, creating momentum for further change.

Longer-term Strategic Transformation

As IBM advanced in its digital transformation journey, the company recognized the need for continuous adjustments to stay aligned with market dynamics and internal feedback. This iterative approach was crucial for maintaining IBM's relevance and competitive edge. IBM established robust mechanisms for collecting and analyzing feedback from customers, employees, and industry experts, enabling the company to identify emerging trends and adapt its strategies accordingly. Utilizing advanced data analytics, IBM tailored its services to meet evolving market demands effectively.

IBM prioritized continuous learning and development through initiatives like the IBM SkillsBuild program, ensuring that its workforce remained at the forefront of technological advancements. This focus on upskilling fostered innovation and agility within the company. Additionally, adopting agile methodologies across its operations enhanced IBM's ability to respond swiftly to changes, reducing time to market for new solutions and maintaining competitiveness amidst rapid industry changes.

To embed its transformation deeply and align with global market needs, IBM undertook significant strategic realignment initiatives. A key component was decentralizing decision-making authority to regional leaders, improving responsiveness to local market conditions and enhancing global presence. This empowerment allowed IBM to innovate more effectively and address customer needs with greater precision.

IBM also focused on sustainability and corporate responsibility as part of its long-term strategic realignment. Recognizing the growing importance of environmental and social governance (ESG) criteria, IBM integrated sustainable practices into its business operations. This commitment to sustainability not only aligned IBM with global market expectations but also enhanced its reputation as a responsible and forward-thinking organization.

Cultural Integration and Operational Challenges in IBM's Digital Transformation

IBM encountered significant difficulties in merging old and new business cultures and operational practices during its digital transformation. The company's long-standing legacy culture, deeply rooted in its hardware-centric business model, clashed with the agile and innovative mindset required for a digital-first approach. This cultural inertia was a substantial barrier to change, as employees accustomed to traditional hierarchies and processes were resistant to adopting new methodologies and technologies.

One of the primary challenges was breaking down silos within the organization. IBM's historical structure was characterized by rigid departmental boundaries, which impeded the free flow of information and collaboration essential for agile operations. Integrating cross-functional teams under the IBM Garage Methodology required a fundamental shift in how employees viewed their roles and responsibilities. Despite extensive training programs like the Think Academy, fostering a culture of continuous learning and adaptability proved challenging.

Operationally, IBM faced the daunting task of aligning its existing infrastructure with new technological platforms. The integration of cloud-based services with legacy systems required significant re-engineering efforts. Ensuring compatibility and seamless operation across old and new systems demanded substantial investment in time and resources. Furthermore, the shift to a service-oriented business model necessitated new performance metrics and evaluation criteria, replacing traditional measures focused on product sales and efficiency.

IBM's digital transformation journey was also challenged by the rapid pace of technological advancements and aggressive competition. The tech industry, marked by its relentless innovation cycles, required IBM to continuously evolve its offerings to stay relevant. Competitors such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud were not only quick to adopt new technologies but also excelled in scaling their solutions globally, putting pressure on IBM to match their pace and capabilities. Keeping up with technological changes involved substantial R&D investments. IBM needed to innovate in emerging areas like artificial intelligence, hybrid cloud, and cybersecurity to maintain its competitive edge. This required not only financial resources but also attracting and retaining top talent in these cutting-edge fields, a challenging endeavor given the competitive job market for tech professionals.

IBM faced significant competitive pressure from companies that had successfully adopted more flexible and scalable business models. These competitors, unburdened by legacy systems, could rapidly deploy new solutions and capture market share by meeting the growing demand for cloud-based services and integrated digital solutions. IBM's traditional hardware-centric image also posed a challenge in repositioning itself as a leader in the digital space. Adapting to these technological and competitive pressures was further complicated by the need to ensure security and regulatory compliance across its expanded digital footprint. As IBM integrated more advanced technologies and expanded its service offerings, maintaining robust cybersecurity measures and complying with diverse global regulations became increasingly complex.

IBM's digital transformation faced significant challenges in cultural and operational integration, as well as in keeping pace with rapid technological advancements and aggressive competitors. Overcoming these obstacles required strategic realignment, continuous learning, and substantial investment in new technologies and business models. These efforts were crucial for IBM to remain competitive and achieve sustained success in the digital era.

Future Trajectories: The Path Forward

IBM's strategic transformation positioned it at the cusp of several promising avenues, each with the potential to

further strengthen its leadership in the technology sector. As the dust settled from its extensive overhaul, IBM was poised to leverage its newfound agility and innovative prowess to navigate the rapidly evolving tech landscape.

IBM's pioneering work in quantum computing stood out as a significant area for future growth. The company's advancements in this field promised to address complex computational problems across various industries, from pharmaceuticals to financial services. IBM's quantum computers, such as the IBM Quantum System One, demonstrated the potential to revolutionize how businesses process information, solve intricate problems, and develop new products. This breakthrough positioned IBM not just as a participant but as a leader in the next wave of technological innovation.

IBM's deep expertise in artificial intelligence and blockchain technology opened doors to innovative solutions for secure and transparent data management. Integrating AI with blockchain could provide unique value propositions, such as enhancing supply chain transparency, improving security protocols, and automating complex business processes. These innovations could allow IBM to differentiate itself in a crowded market, providing clients with advanced, secure, and efficient solutions.

IBM's commitment to sustainability and corporate responsibility continued to be a cornerstone of its strategy. By integrating sustainable practices into its operations and helping clients achieve their own ESG goals, IBM could strengthen its reputation as a forward-thinking and responsible technology leader. This focus on sustainability would not only meet the growing demand for environmentally friendly practices but also attract clients and partners who prioritize corporate responsibility.

IBM's digital transformation redefined its market position and set new industry standards. The company's continued investment in emerging technologies, sustainability, partnerships, and workforce development positioned it to capitalize on future opportunities. However, further changes loomed on the horizon--with no end in sight. How could IBM best use their resources to not only lead but also redefine the tech industry once again? What might this require?

Endnotes

[1] https://www.forbes.com/councils/forbescommunicationscouncil/2019/12/26/three-tips-for-staying-innovative-as-a-technology-company/

[2] Sabbah, Danny. "IBM Cloud: Pioneering Digital Transformation." YouTube, uploaded by IBM Cloud, 2021, https://www.youtube.com/watch?v=LGJjRJvJJ0k

[3] Sabbah, Danny. "IBM Cloud: Pioneering Digital Transformation." YouTube, uploaded by IBM Cloud, 2021, www.youtube.com/watch?v=HeX1re1Y69Q.

[4] https://www.redhat.com/it/about/press-releases/ibm-acquire-red-hat-completely-changing-cloud-landscape-and-becoming-world%E2%80%99s-1-hybrid-cloud-provider

[5] https://www.redhat.com/en/about/press-releases/ibm-acquire-red-hat-completely-changing-cloud-landscape-and-becoming-worlds-1-hybrid-cloud-provider

[6] https://news.lenovo.com/pressroom/press-releases/lenovo-to-acquire-ibm-personal-computing-division/

References

Ganoorkar, V., Meza, L., & Parisa, V.. (Jan 29, 2024). "The Blueprint for a Modern Data Center." IBM Blog. www.ibm.com/blog/the-blueprint-for-a-modern-data-center/

Humphries, D. (January 25, 2022). "Digital Transformation Becomes a Way of Life." www.ibm.com/blog/2022-digital-transformation-becomes-a-way-of-life/

Smith, T. (September 16, 2022). "Why IBM's "Deep Cloud" Is a Digital Transformation Blueprint." Acceleration Economy. https://accelerationeconomy.com/cloud-wars/horizon/why-ibm-deep-cloud-is-a-digital-transformation-blueprint/

Shooter, K. (May 17, 2020). "IBM's Seven Steps to Digital Transformation." Technology Magazine. https://technologymagazine.com/data-and-data-analytics/ibms-seven-steps-digital-transformation

Sabbah, D. (2021). "IBM Cloud: Pioneering Digital Transformation." YouTube, uploaded by IBM Cloud. https://www.youtube.com/watch?v=LGJjRJvJJ0k

Stripe, D. (2021). "IBM-Digital Transformation." YouTube, uploaded by IBM. www.youtube.com/watch?v=pzYT80wgllM

Kode, S. (2021). "Techwave Teaming with IBM to Navigate Digital Transformation." YouTube, uploaded by Techwave Consulting. https://www.youtube.com/watch?v=pzYT80wgllM

Foster, M. (2021). "Seeing an Acceleration in Digital Transformation, IBM Services." YouTube, uploaded by IBM Services. www.youtube.com/watch?v=sb4b3lhamak

Sabbah, D. (2021). IBM's Digital Transformation and Hybrid Cloud Strategy. YouTube, uploaded by IBM Cloud. Retrieved from www.youtube.com/watch?v=LGJjRJvJJ0k

IBM. (September 27, 2022) "IBM Transformation Index: State of Cloud." . IBM Institute for Business Value, IBM. www.ibm.com/thought-leadership/institute-business-value/en-us/report/transformation-index

IBM. (n.d) "The origins of IBM." https://www.ibm.com/history/ctr-and-ibm

"The Editors of Encyclopaedia Britannica." (Updated August 1,2024). IBM. Encyclopaedia Britannica. https://www.britannica.com/money/International-Business-Machines-Corporation

Cohen, D. (February 22, 2024) "IBM changed history and then couldn't keep up with it." Australian Financial Review. https://www.afr.com/work-and-careers/management/ibm-changed-history-and-then-couldn-t-keep-up-with-it-20240219-p5f5xc

Kiron, D., & Spindel, B. (February 19, 2019). "Rebooting work for a digital era: How IBM reimagined talent and performance management." MIT Sloan Management Review. https://sloanreview.mit.edu/case-study/rebooting-work-for-a-digital-era/

IBM. (n.d.) "IBM builds its first cognitive supply chain." https://www.ibm.com/case-studies/ibm-supply-chain

O'Brien, K., & Downie, A. (January 8, 2024). "Digital transformation strategy." IBM Blog. https://www.ibm.com/blog/digital-transformation-strategy/

IBM. (n.d.) "What is digital transformation?" https://www.ibm.com/topics/digital-transformation

IBM. (n.d.) "Digital Transformation at Work." https://mediacenter.ibm.com/media/Digital+Transformation+at+Work/1_933townw

Red Hat. (July 9, 2019). Q&A: IBM's landmark acquisition of Red Hat. Red Hat Blog. https://www.redhat.com/en/blog/qa-ibms-landmark-acquisition-red-hat

IBM. (n.d.) "Why IBM's acquisition of Red Hat is a game-changer for the cloud industry." https://newsroom.ibm.com/Why-IBMs-acquisition-of-Red-Hat-is-a-game-changer-for-the-cloud-industry

Lenovo. (December 7, 2024). Lenovo To Acquire IBM Personal Computing Division. https://news.lenovo.com/pressroom/press-releases/lenovo-to-acquire-ibm-personal-computing-division/

Armonk, NY and Raleigh, NC. (October 28, 2018). https://www.redhat.com/en/about/press-releases/ibm-acquire-red-hat-completely-changing-cloud-landscape-and-becoming-worlds-1-hybrid-cloud-provider