JORGE CALVO - CARLOS ESCAPA

The AI driven business

Leading, Competing, and Thriving in the Age of Artificial Intelligence

Libros de Cabecera

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We are already in the era of AI-augmented enterprises. The advantage does not lie in the technology itself, but in how you —as a leader— choose to apply it. Are you ready to lead in an environment where artificial intelligence is reshaping strategy, competition, and the future of your business?

This book is not about algorithms; it is about leadership and vision. It provides the roadmap you need to transform your organization and position it at the forefront of change.

You will learn how artificial intelligence multiplies value, unlocks opportunities, and turns uncertainty into advantage. Through clear insights, compelling examples, and actionable frameworks, Jorge Calvo and Carlos Escapa—renowned international experts—demonstrate how to embed AI at the very core of business. Covering cases that span professionals, entrepreneurs, SMEs, and large corporations, they offer a perspective that is both realistic and ambitious, connecting strategy with execution.

This is not a book for technicians, but for leaders who understand that the greatest risk is not misusing AI, but ignoring it. Here, you will find the keys to building a smarter, more resilient, and more competitive enterprise. Above all, you will learn to lead with augmented intelligence, vision, and boldness.

The time to act is not tomorrow—it is now.

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Glossary

A/B Testing: Experimental technique used to compare two variants of an AI-based system and adjust its performance in dynamic environments. It is key to ensuring that the solution remains aligned with data and user expectations over time.

AGI (Artificial General Intelligence): Type of artificial intelligence, still under research, that aims to reach a level of reasoning and self-awareness similar to that of humans, capable of adapting to any cognitive task.

AI Act (EU AI Regulation): European legal framework that regulates the development, commercialization, and use of AI based on its level of risk to individuals and society.

AI Adoption Cycle: Sequence companies go through when implementing AI: exploration, pilot, scaling, integration, and finally, organizational transformation.

AI as a Service (AIaaS): Model for delivering artificial intelligence services on demand, provided by third parties through cloud platforms.

AI as Copilot: Metaphor describing AI as support for professionals in their tasks, not replacing them but enhancing their judgment and productivity.

AI Mindset: Organizational attitude oriented toward continuous learning, experimentation with AI, and decision-making based on augmented data.

AI Moat: Competitive advantage built from AI-based business models and operations that are difficult to replicate, thanks to proprietary data, specialized talent, and cumulative learning. It acts as a barrier to entry that protects market position and generates long-term economic value.

AI Platforms: Technological infrastructures designed for the agile and secure deployment of AI solutions, integrating data, models, and governance.

AI Regulation: Regulatory framework that establishes principles, obligations, and limits for the development and use of artificial intelligence, such as the European AI Act.

AI Stack: Set of technological layers that make up an artificial intelligence solution: from infrastructure and data to models, APIs, and the end-user experience.

AI-Driven Transformation: Strategic process through which an organization redesigns its culture, operations, and business model with AI as its central engine.

AI-Driven: Strategic approach in which artificial intelligence becomes the main driver of business transformation, boosting innovation, operational efficiency, and competitive advantage. An AI-driven organization integrates AI at the core of its business processes and decision-making, laying the foundation for the "Three Strategic Horizons" discussed in the book.

AI-First: Organizational approach in which AI is not added afterward but is part of the business design and architecture from the very beginning.

AIGC (AI-Generated Content): Text, image, video, or audio content created directly by artificial intelligence models without direct human intervention.

Algorithm: Mathematical models and sets of logical, sequential instructions that enable task resolution; in AI, algorithms are the core of machine learning.

Algorithmic Anthropomorphism: Tendency to attribute human traits to AI systems, which can generate mistaken perceptions about their autonomy or consciousness.

Algorithmic Benchmarking: Systematic comparison of the performance of different AI models against standardized tasks or metrics in order to select the best option.

Algorithmic Bias: Tendency of an AI model to produce systematically biased results, caused by unrepresentative training data or design flaws.

Algorithmic Delimitation: Technique to restrict the scope or application of AI by setting rules or boundaries to avoid undesired risks.

Algorithmic Empowerment: Enhancement of human talent through AI systems that support decision-making, creativity, or tactical execution.

Algorithmic Ethics: Critical reflection on the social impacts, biases, and unintended consequences of AI use, and how to design it in a fair and responsible way.

Algorithmic Frontier: Knowledge or capability boundary reached by an organization in its use of AI, determining its competitive potential.

Algorithmic Gap: Difference between those who have access to advanced AI models and those who do not, generating inequalities in productivity, knowledge, and power.

Algorithmic Scalability: Ability of an AI model to maintain its performance and usefulness as the volume of data, users, or use cases increases.

Algorithmic Segmentation: Automatic identification of customer profiles or groups using clustering and machine learning techniques, enhancing campaigns and products.

Algorithmic Sovereignty: Capability of a State or region to govern the AI models, infrastructures, and data that affect its population and economy.

Algorithmic Traceability: Capability to record and audit the functioning of an AI model in order to understand how and why it made a decision.

Algorithmic Window of Opportunity: Historical moment in which an organization, sector, or country can strategically position itself if it adopts AI quickly and with vision.

AlphaFold: neurosymbolic model developed by Google DeepMind that predicts protein structures, marking a scientific milestone in computational biology.

Analytics: Set of methods used to extract value from data and support business decisions. AI amplifies this capability by processing unstructured data and uncovering complex patterns across multiple digital formats.

API (Application Programming Interface): Set of rules and protocols that allow different systems or services to communicate with one another, fundamental for integrating AI into digital products.

Artificial Neural Networks: Computational models inspired by the human brain that identify complex patterns in data and solve tasks such as classification or prediction.

As-a-Service: Business model that delivers technology solutions (such as AI, software, or infrastructure) as on-demand, scalable, externally managed services.

Augmented Co-Creation: Collaboration between humans and artificial intelligence to design products, services, or solutions by integrating creativity with AI's generative capacity.

Augmented Human: Person whose cognitive or productive capacity is amplified through the strategic use of AI tools.

AutoML: Tools that automate parts of the process of selecting, parametrizing and training machine learning models.

Big Data: Massive collection of structured and unstructured data whose exploitation requires new architectures that manage data in parallel, such as lakehouses, serving as the foundation for training ML models.

Chain of Thought (CoT): Technique that allows LLMs to break down complex tasks into intermediate logical steps, improving reasoning interpretability.

Chatbot: Automated conversational assistant, powered by LLMs, that interacts with users through natural language, either via text or voice.

Chief AI Officer (CAIO): Emerging executive role responsible for the strategy, governance, and cross-enterprise deployment of artificial intelligence.

Chief Data Officer (CDO): Executive responsible for leading the management, quality, and strategic data value within an organization.

Classification: Fundamental machine learning algorithm that assigns categories or labels to data according to learned patterns.

Cloud: Digital infrastructure that provides on-demand access to computing, storage, and data processing resources. It is key to training models at scale, and scaling AI applications flexibly and efficiently.

Clustering: Unsupervised machine learning technique that identifies natural groupings in data without prior labels.

Cobot: Robot designed to work alongside humans in shared environments without physical separation, applying AI to adapt in real time.

Cognitive Productivity: Ability to generate intellectual value (analysis, creativity, decision-making) efficiently, enhanced by AI use.

Composable Architecture: Technology design based on independent modules (composables) that can be flexibly combined to create customized AI solutions.

Computer Vision: Branch of AI that enables machines to interpret images and videos to recognize patterns, objects, faces, or scenes with accuracy and in real time.

Conversational AI: Subtype of artificial intelligence focused on maintaining natural dialogues with people, based on advanced language models.

Copilot: Microsoft's intelligent assistant integrated into its products, enabling the automation and augmentation of user cognitive tasks with generative AI.

Core Processes: Central business processes (such as manufacturing, logistics, or sales) where AI can generate significant impact if properly integrated.

CPU (Central Processing Unit): General-purpose processor that executes program instructions. While versatile, its capacity to train and run AI models is limited compared to specialized architectures such as GPUs.

Customer Co-Creation: Process in which the customer actively participates in the design or improvement of products and services, enhanced by AI tools.

Customer Data Platform (CDP): Platform that unifies all customer data into a single view, enabling personalized actions supported by predictive algorithms.

Dashboard: Interactive visual panel that summarizes and presents key data in real time, allowing monitoring of indicators, AI models, and business processes to support informed decision-making.

Data flywheel: Dynamic in which the use of AI generates more data, which in turn feeds new models, creating an expanding and cumulative competitive advantage.

Data Governance: Management framework that regulates access, use, quality, security, and accountability regarding data within an organization.

Data Lake / Lakehouse: Storage system that allows structured and unstructured data (text, images, logs, etc.) to be stored and used for advanced analytics and AI projects.

Data Monetization: Strategy to generate economic value from proprietary data, either through internal efficiencies, sales, licensing, or new business models.

Data scientist: Professional specialized in extracting value from large volumes of data through statistical, programming, and artificial intelligence techniques.

Data-Driven Culture: Organizational culture that promotes decision-making based on objective data and analysis rather than intuition or hierarchy.

Deep Learning: Subfield of machine learning to train deep neural networks, ideal for processing large volumes of unstructured data such as images, audio, or molecular sequences.

Deep Neural Networks (DNN): Directed computational graphs with multiple hierarchical layers that learn complex representations and solve advanced tasks such as computer vision or natural language processing.

Diffusers: Generative models that create high-fidelity content (such as images or audio) by reversing progressive diffusion processes, offering high stability and flexibility.

Digital Strategic Autonomy: Ability of a country or region to develop and govern its own key technological infrastructures without depending on third parties.

Digital Twin: Virtual replica of a real process, object, or system that allows simulation of behaviors and optimization of operations with AI support.

DRL (Deep Reinforcement Learning): Variant of reinforcement learning that uses deep neural networks to tackle highly complex problems.

Dual-Use AI: Ambivalent nature of AI that enables both constructive uses and potentially destructive or harmful applications.

Dynamic Pricing: Automatic price adjustment based on demand, competition, or customer behavior, using machine learning algorithms.

Edge AI: Artificial intelligence executed locally on physical devices (mobiles, sensors, cameras) without relying on the cloud, useful for real-time decisions.

Embedded AI: Discreet integration of artificial intelligence into products, processes, or devices, operating almost invisible to the end user.

Embeddings: Numerical representations (vectors) that capture the contextual meaning of elements such as words, images, or products, enabling a model to relate them semantically to one another.

Engagement: Level of involvement, attention, or loyalty that a user shows toward a brand, product, or service. AI enables measurement and optimization of this bond through personalization and real-time behavioral analysis.

Enhanced Decision-Making: Business decision-making process supported by AI systems that provide real-time recommendations, simulations, or analysis.

Enhanced Leadership: Leadership style that incorporates AI tools to enhance strategic vision, information analysis, and decision-making.

Enhanced Productivity: Ability to produce more value with the same resources through AI-powered tools that amplify human capabilities.

Enhanced Technology: Technology that expands human capabilities rather than replacing them, as is the case with many AI applications in business.

Enhanced Value Chain: Value chain model where artificial intelligence increases efficiency, personalization, or anticipation in key business activities.

Enhancing Customer Experience: Improved interaction between customer and company thanks to the personalization, anticipation, and automation provided by AI.

Expert Systems: Early AI models based on rules and formal logic, designed to emulate expert human reasoning in specific domains.

Explainable Models (XAI): Approaches and techniques aimed at increasing the transparency of AI models, making it easier for humans to understand how decisions are made.

Exponential Technologies: Technologies that progress at a nonlinear, accelerated pace (such as AI, biotechnology, quantum computing), with disruptive global impact.

Federated Learning: AI technique that enables model training without centralizing the data, thereby protecting privacy and security.

Feedback: Information returned that an AI system uses to evaluate and adjust its behavior based on obtained results, essential in supervised learning, reinforcement, and continuous improvement cycles.

Flywheel: Fundamental strategic concept in which a business process improves continuously and generates self-sustaining growth. The creation of flywheels is facilitated by leveraging data flows that adapt decision-making and continuously improve customer experience in a virtuous cycle.

General-Purpose AI: AI models (such as LLMs) not designed for a single task but adaptable to multiple uses and industries.

Generative AI: Branch of AI specialized in the autonomous creation of new content (textual, visual, musical, etc.) based on patterns learned from large datasets.

Google Tax: Proposed fiscal levy on major digital platforms for the use and monetization of user-generated data in different countries.

GPT (Generative Pretrained Transformer): Transformer-based language model pretrained on large volumes of text, capable of generating and understanding natural language with contextual coherence.

GPU (Graphics Processing Unit): Processor designed for massive parallel tasks, ideal for training and running AI models thanks to its ability to handle large volumes of data simultaneously.

Human-Centered AI: Approach to AI design and application that prioritizes human well-being, dignity, and rights.

Hybrid AI: Model that combines different approaches to artificial intelligence (symbolic, statistical, connectionist) or techniques (machine learning with rules) to improve performance.

AI (Artificial Intelligence): Technology that relies on data to generate executable code based on statistical patterns, some of which resemble human cognitive processes associated with intelligence. In the business context, AI acts as a business flow accelerator and amplifier of human capabilities, optimizing complex processes and generating valuable insights for high-impact strategic decision-making.

Industry 4.0: Evolution of industry based on automation, digitalization, sensors, IoT, and now AI, to achieve smart factories.

Inference: Process by which a trained model applies what it has learned to solve new cases in real time.

Integrated AI: Deployment of AI not as a standalone tool but as part of the workflow, system, or business process.

Intelligent Automation: Combined use of AI, RPA (Robotic Process Automation), and business rules to optimize complex processes without constant human intervention.

IoT (Internet of Things): Network of connected devices that generate real-time data from the physical environment. Its integration with AI enables process automation and more precise decision-making in operations, logistics, or maintenance.

KPI (Key Performance Indicator): Performance indicators enhanced by AI to improve precision, contextualization, and predictive capacity in the business context.

Lakehouse: Hybrid infrastructure that combines the advantages of data lakes and data warehouses, enabling data integration and governance for advanced analytics and training AI models at scale.

LLM (Large Language Model): Foundation model trained on large volumes of text to understand, generate, and reason in natural language. They are the basis of conversational assistants and generative AI tools.

LRM (Large Reasoning Model): LLM specifically trained to use Chain of Thought (CoT) prompting to break down complex problems into a step-by-step reasoning process.

Machine Learning: Set of statistical algorithms that analyze training data to detect patterns and embed them into executable programs for inference or prediction. Machine learning generates two major types of executables: (1) rule engines, such as decision trees, or (2) multivariable functions, such as linear regressions or neural networks.

Machine Vision: Capability of machines to interpret images or video in real time, with applications in quality, security, and logistics.

Marketing Automation: Use of algorithms and AI to personalize campaigns, optimize advertising budgets, and improve conversion in real time.

Metadata: Data that describe other data, facilitating their organization, search, and analysis. In AI, they help structure unlabeled information and enable efficient model training.

Mixture of Experts (MoE): AI architecture composed of multiple specialized "experts," whose selective activation enables more efficient resolution of complex tasks.

MLOps: Set of practices for managing the lifecycle of machine learning models in production environments, ensuring scalability, maintenance, and continuous updating.

Model Lifecycle: Set of stages an model goes through, from development to deployment, maintenance, and continuous improvement.

NLP (Natural Language Processing): Branch of AI that enables systems to interpret, generate, and analyze human language.

OpenAI: Pioneering AI company that develops frontier models and AI applications such as ChatGPT and DALL·E.

Operational Digitalization: Process of incorporating digital tools—including AI—into the management of operations, production, logistics, or customer service.

Prediction: Estimation of a future value or outcome based on patterns learned from past data. Often used interchangeably with "inference"

Predictive Analytics: statistical techniques that predict future behaviors from historical data.

Prescriptive Analytics: Advanced level of analytics that predicts what may happen and suggest actions to influence outcomes.

Prompt: Instruction or input provided by the user to a generative model to trigger a textual, visual, or multimodal response.

RAG (Retrieval-Augmented Generation): Technique that improves response generation by combining information retrieval with text generation, increasing accuracy and relevance.

Recommender System: AI system that suggests personalized products, content, or services based on historical data and behavioral patterns.

Regression: Statistical and machine learning technique used to predict numerical values based on multiple input variables.

Reinforcement Learning: AI technique in which an agent learns through trial and error, optimizing decisions based on a reward function.

Resistance to Change: Common cultural barrier in AI transformation processes, stemming from fear, mistrust, or lack of understanding.

Responsible AI: Approach that integrates ethical, regulatory, and social principles into the design, development, and use of AI systems.

Retraining: Process of updating an MLI model with new data to improve performance or adapt to environmental changes.

RPA (Robotic Process Automation): Technology that automates repetitive, rule-based tasks through software bots. When integrated with AI, it extends to more complex and adaptive processes.

Scoring: Automatic assignment of a score to customers, users, or situations through algorithmic models, used for decisions such as credit approval, lead prioritization, or risk detection.

Sentiment analysis: Natural Language Processing (NLP) technique that identifies opinions, emotions, or attitudes expressed in text, useful in marketing, customer service, and HR.

Smart Retail: Transformation of retail through AI to optimize assortment, promotions, customer service, inventory management, and omnichannel experience.

Talent flywheel: Dynamic in which the use of AI attracts talent, and that talent drives better AI solutions, creating a virtuous cycle that is difficult to replicate.

Technological Asymmetry: Gap in capabilities among countries, companies, or regions in terms of development, access, or control of advanced technologies such as AI.

Technological Convergence: Integration of different technologies (AI, IoT, robotics, blockchain, etc.) to create more powerful and transformative business solutions.

Technological Soft Power: Influence a country exerts through its companies, standards, or digital platforms, beyond direct military or economic power.

TinyML (Tiny Machine Learning): Application of machine learning in ultra-low power devices, enabling embedded AI in sensors and appliances without constant cloud connectivity.

TPU (Tensor Processing Unit): Specialized chip developed by Google to accelerate AI model training and inference, particularly deep neural networks optimized for TensorFlow.

Transformers: Neural network architecture based on attention mechanisms that has revolutionized sequential processing and underpins most LLMs, LRMs and Generative AI generally.

Upskilling: Process of updating skills that allows employees to adapt to new work environments transformed by AI.

Widespread AI accessibility: Process through which AI capabilities are made accessible to all employees, beyond purely technical profiles.

Workflow: Structured sequence of automated or human tasks that can be optimized through AI for greater efficiency.

The authors

Jorge Calvo

Professor, international speaker, and advisor on corporate strategy and digital transformation, based in Tokyo and Barcelona. He holds a PhD in Economics and Business Administration from Universitat Abat Oliba CEU and has completed executive programs at Harvard Business School (HBS), the Massachusetts Institute of Technology (MIT), and ESADE Business School.

He currently serves as Deputy Dean of GLOBIS Graduate School of Management in Tokyo, where he also teaches Strategy and Digital Innovation and leads institutional digital transformation projects. In addition, he is Academic Director and Professor of the open program "*AI in Business*" at ESADE Executive Education and actively participates as a professor in MBA and EMBA programs, as well as in specialized courses such as "*AI & IoT Enabling Technologies*" and "*AI & Robotics Business Innovation*" at both ESADE and GLOBIS.

His academic and consulting work extends internationally, collaborating with institutions such as INALDE Business School (Colombia) and STC Academy (Saudi Arabia), and speaking at major global conferences on innovation and digital leadership.

With more than four decades of global business leadership experience, Jorge Calvo is recognized for his expertise in digital transformation and innovation through disruptive technologies, as well as his contributions to the development of responsible and ethical artificial intelligence.

He is a board member of the Japan Operations Management and Strategy Association and the Japan Society for Artificial Intelligence. Previously, he held senior executive roles such as Global President of SCM & IT at Roland DG Corporation headquarters in Japan, and President and CEO for EMEA.

He is the author of several influential books, including *Viaje al futuro de la empresa (Journey to the Future of the Company)*, published in Spanish, English, and Japanese and recommended by Japan's Minister of Digital Affairs, Taro Kono. He is also coauthor of *Wa: Claves de la cultura corporativa japonesa (Wa: Keys to Japanese Corporate Culture)*, a book endorsed by the organizing committee of the 400th Anniversary of Japan-Spain Relations.

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With more than three decades of experience in global technology leadership, Carlos has played a central role in advancing artificial intelligence at some of the world's largest tech companies. At Amazon Web Services (AWS), he served as Data & AI Global Practice Lead, driving the worldwide strategy for alliances and the deployment of large-scale data and AI solutions across both public and private sectors. Previously, he was Director of Global AI Business Development at Meta (formerly Facebook), where he championed AI integration into products and services worldwide and contributed to the growth of open-source projects such as PyTorch, now a cornerstone of the AI community.

His work combines technological innovation with building collaborative ecosystems, fostering knowledge transfer between industry and academia. He has led the development of reference architectures for machine learning, data modernization methodologies, and AI-driven solutions applied to real-world use cases in critical sectors, contributing to the delivery of hundreds of production projects around the globe.

Carlos also teaches in ESADE's open program "*Artificial Intelligence in Business*" (Spain) and lectures on "*Artificial Intelligence and Entrepreneurship*" at business and law schools in the Americas, Europe, and Asia. These include EGADE and UNIVA (Mexico), HEC (France), Universidad de los Andes and Universidad de Medellín (Colombia), Chulalongkorn Uni-

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