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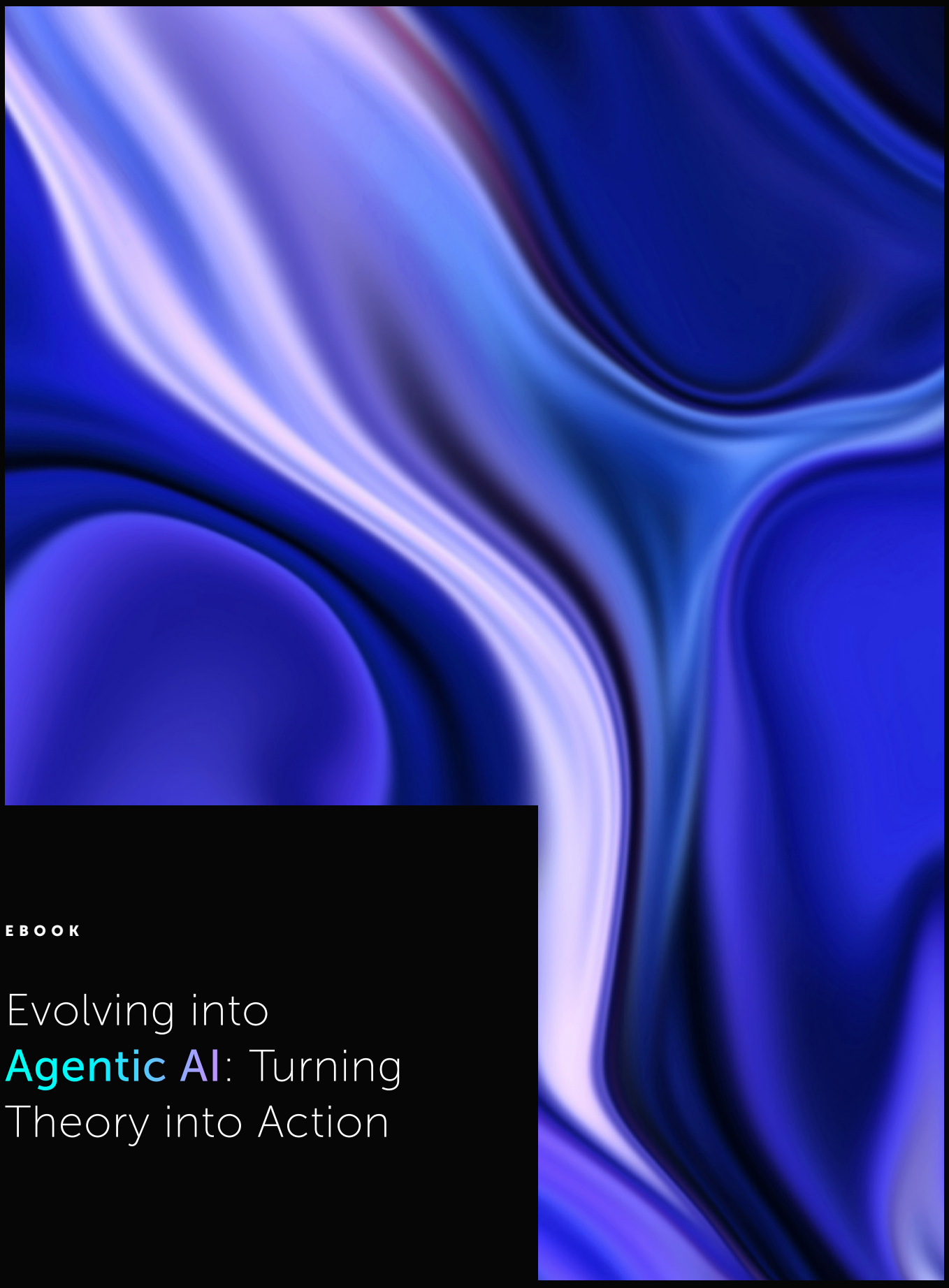


EBOOK

Evolving into Agentic AI: Turning Theory into Action

Contents

Introduction

Technology evolution is continuous, rapid and unapologetic. The modern enterprise doesn't just innovate. It executes. AI adoption serves as a pivotal force that propels companies to bridge the gap between technology investments and measurable business impact.

Now, the next catalyst for broader AI innovation is here: Agentic AI – the latest development under the intelligent automation umbrella that promises to shape customer interactions and redraw the map of enterprise value creation.

While many companies are still grappling with a holistic approach to generative AI (GenAI) at scale, they're now facing the need to factor the next phase of AI disruption from agentic AI into their enterprise strategies.

In the year ahead, companies need to move at a high speed while grounding their AI investments in tangible, pragmatic business goals and use cases.

As we advance from prompts that serve answers to agents that "think" and act in radically new workflows, companies must build an ecosystem where AI agents collaborate with humans to drive business outcomes. For enterprises, establishing enablement programs that support adoption and governance to ensure safety and empower transparency will become paramount.

For executives, implementing a flexible strategy that can keep pace with the need for speed today, while being prepared to advance with future technological advancements in a human-centric way — that's the real call to action on agentic AI.

What is Agentic AI & What's in Store for the AI-Enabled Enterprise?

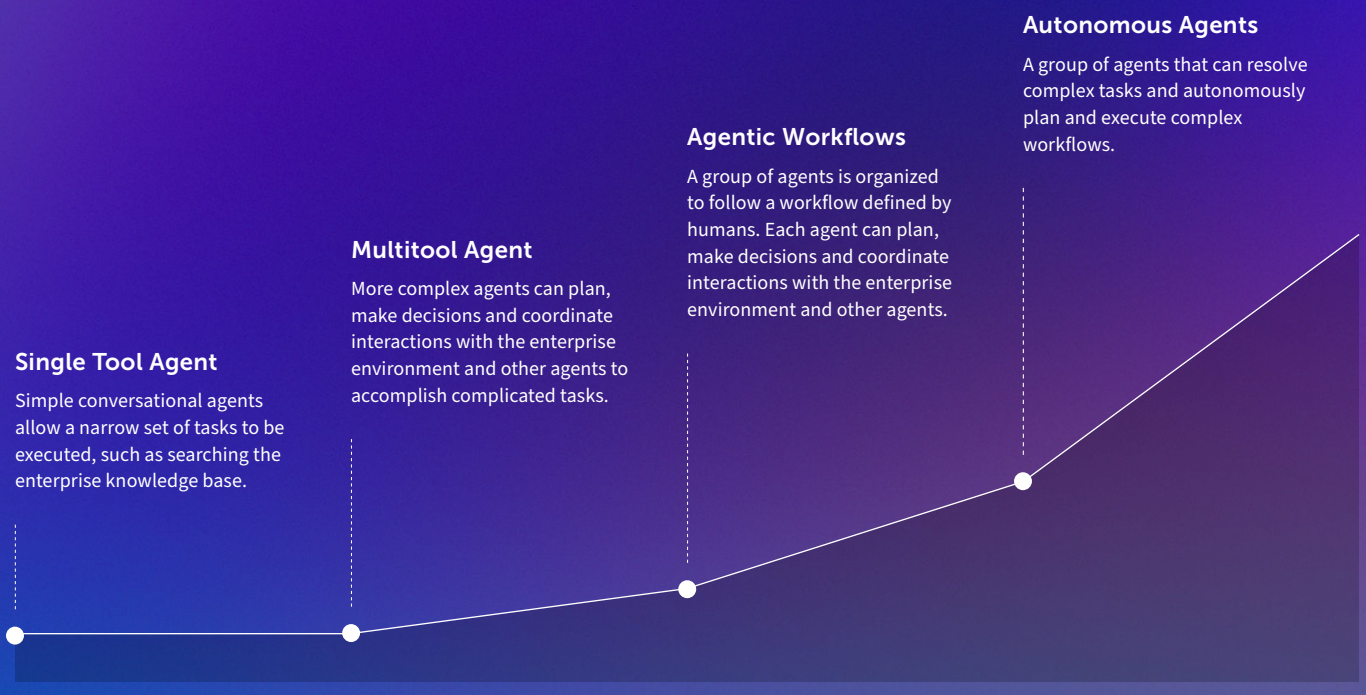
As the "last mile" in scaling AI, automation represents the critical phase where ideas and deployment efforts coalesce into tangible results. Within the realm of automation lies an emerging subset that's reshaping the narrative — Agentic AI.

Agentic AI refers to intelligent systems that empower enterprises to transform operations and achieve measurable outcomes by seamlessly integrating autonomous decision-making into existing workflows.

While traditional robotic process automation (RPA) tools have served enterprises well — handling repetitive workflows and bringing efficiency — automation systems need to go beyond the basics. Agentic AI can optimize and refine processes, ensuring that companies achieve results from technological undertakings.

And sometimes, with the right use case, agentic AI can reinvent the entire end-to-end value chain — connecting disparate processes and making new decision trees possible with and without human actors.

Evolution of AI Agents



Our approach to agentic AI focuses on precision, scalability and adaptability, providing enterprise-grade solutions designed to tackle complex, interconnected use cases across industries and functions.

These systems prioritize actionable impact, combining autonomy with strategic alignment to business objectives, enabling organizations to unlock:

01

NEW REVENUE STREAMS

02

ENHANCED OPERATIONAL EFFICIENCY

03

HYPER-PERSONALIZED USER EXPERIENCES

All through AI-native services optimized for execution at scale.

It's not just about autonomy; it's about creating resilient, data-driven ecosystems that change in real time to meet dynamic enterprise demands.

So, what can companies expect in this next phase of AI automation?

- AI services develop into actors and personas in enterprise business processes
- Agents become intermediaries between consumers and the enterprise
- Executives adopt new ways of imagining business opportunities based on agent-derived insights
- Self-service transforms into a collaboration between humans and AI
- Basic AI fluency becomes table stakes across the enterprise
- Operating procedures defined by the business will ensure agent consistency
- English becomes the new programming language

Real-World Success Stories: Going from "What If" to "What's Next"

Agentic AI shows real promise in functional and industry-specific use cases. However, many enterprises saturate their pipeline with every use case imaginable. This approach will quickly constrain your resources and drain your funding. In fact, the number one reason why 80% of AI projects fail is that leaders misunderstand or miscommunicate what problem needs to be solved with AI.

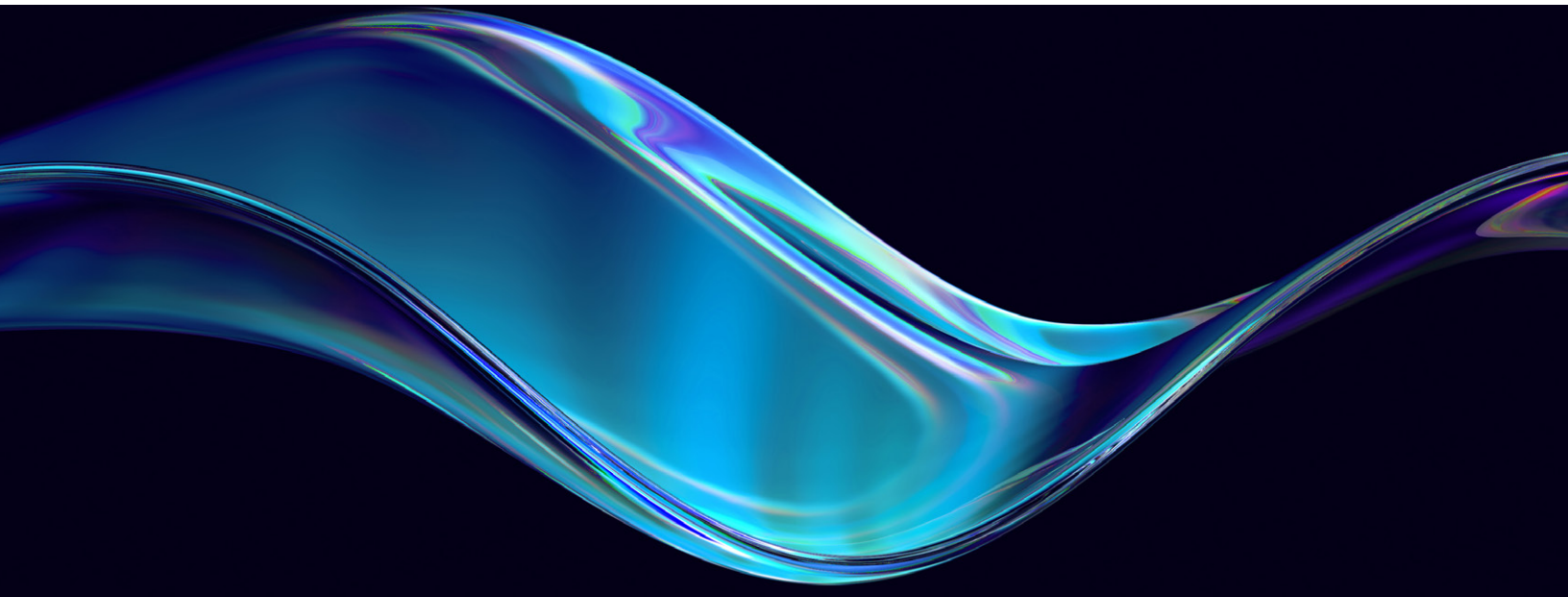
Before chasing use cases, you need clearly defined goals dictated by business needs — not necessarily technology needs — along with a roadmap of how you can achieve them, top-level sponsorship and your projected ROI for each step of the product roadmap.

When partnering with a service provider, you should expect more than a murky, unfounded future promise to achieve your goals — you need a proven approach that drives results from nearly-immediate POCs to scalable prototypes to thoughtfully planned expansion.

Because our reputation is built on complex solution delivery and reliability, we focus on the end state and approach each call for agentic AI through a critical view that addresses business strategy and technological execution simultaneously.

We've helped clients in several industries and across various functions identify and implement the right agentic AI use cases, ones that support their business goals, work in the real world and are enabled by scalable infrastructure.

What makes our cases unique is that, while others are talking about what they see, we are sharing what we have deployed — the good, the bad and the impossibly complex.



SPOTLIGHT #1

Custom Agentic Workflows that Reduce Effort by 50%

A leading insurance company partnered with EPAM to optimize its underwriting process and customer service experience. Our team developed a GenAI underwriting assistant application to help solve complexities behind the highly unstandardized quotation requests. In just four months, the MVP was delivered, which extracts data with high precision and low latency, reducing data extraction time by 50%. With a new agentic workflow and human-in-the-loop to continually improve precision, this competitive market application can be easily extensible to other lines of business in the future.

SPOTLIGHT #2

Agentic AI-Focused Innovation Streams

As a longstanding partner to one of the largest food retail groups, EPAM is working on several AI innovations that embrace agentic workflows and platforms. These include developing conversational AI assistants, automating image creation and promotion for marketing materials, and optimizing eCommerce search functionality for cross-selling opportunities as customers receive AI-recommended products. We are helping the company imagine and develop its entire GenAI infrastructure — providing a foundation for innovative business use cases, safe and secure enterprise applications and agentic workflows to enhance decision-making and drive business value.

SPOTLIGHT #3

Workflow & Operating Model Transformation through Agentic AI Solutions

Over the course of our three-year relationship with a global consumer goods company, we've helped the team along its data transformation journey — building its enterprise data platform and data architecture, supporting its data literacy program and upskilling initiatives, and advising on its data governance and responsible AI strategy. With a solid data foundation in place, the company now has an agentic AI solution with innovative GenAI products, re-invented workflows and optimized operating models that are built to combine autonomy with strategic alignment to business objectives. This leads to greater productivity, adaptability and scalability.

SPOTLIGHT #4

An Agentic Framework that Sets the Foundation for Scale

A major oil and gas operator partnered with EPAM to implement a cutting-edge agentic AI platform. Based on a multimodal enhanced RAG system, the agentic framework serves as the platform's foundation. The platform's capabilities include seismic image interpretation, data analytics, geomodelling and quality control. For a quick win (over a 90-day period), we developed two use cases: data-driven exploration and fault-driven reservoir monitoring. Both are supported by an OSDU-compliant data platform with an advanced 3D user interface. With two of many use cases identified and the POCs completed, we plan to scale this solution in 2025, setting the company up for success in the future and paving the way for novel agentic approaches in the energy industry.

SPOTLIGHT #5

An Agentic Approach to Commerce

By orchestrating multiple intelligent agents in commerce, EPAM is working with a leading athletic manufacturer and apparel company to revolutionize customer loyalty using an agentic approach. We helped the team build a digital coach chatbot that employs advanced tool-calling capabilities, which enables a network of agents to collaborate in real-time to provide customers with personalized sports technology and styling advice. The agentic framework enhances cross-selling opportunities, boosting average order value through intelligent product recommendations. Not only do customers experience a significant reduction in time spent searching for the right products, but for the leading retailer, brand perception improves.

Agentic AI Industry Solutions, Brought to Life by EPAM

All projects listed are currently completed or underway with our globally distributed teams.

INDUSTRIAL

- Built a GenAI solution that uses a multi-agent approach for a global automotive services and technology provider that helps internal teams automatically resolve support tickets, boosting efficiency by 30+%
- Implemented an agentic command interface solution for a construction manufacturer that orchestrates multiple LLM agents working with dispatcher APIs, resulting in significant dispatching time optimization

HEALTHCARE & LIFE SCIENCES

- Enhanced SKU management for a leading biotech company by using advanced multi-agent communication and secure data handling, which helps supply chain leaders make smarter decisions to reduce waste
- Boosted the efficiency and accuracy of researchers, scientists and analysts by deploying multiple AI search, research and insights agents for a major pharmaceutical company

ENERGY & RESOURCES

- Developed a multi-agentic solution for GRC automation that assesses risk, analyzes policies and enhances decision-making, with a human-in-the-loop mechanism for high-risk cases, for a utilities company
- Implemented a cutting-edge AI platform and agentic framework that supports data-driven exploration and fault-driven reservoir monitoring for an national oil and gas operator

CONSUMER

- Developed an agentic product advisor bot for a beauty product retailer that directs user questions to different platforms for guided customer and employee interactions
- Integrated multiple agents along the cruise experience to help customers navigate their trip and streamline the experience across dining, excursions and general information

INSURANCE

- Created two AI-powered virtual assistants that optimize underwriting (cutting case handling time by 50%) and enhance incoming customer service requests for an insurance provider
- Modernized a candidate application portal through AI-accelerated code migration and AI test generation for a reinsurance company

FINANCIAL SERVICES

- Developed an agentic co-pilot to simplify tax monitoring for tax researchers, achieving a 93% reduction in unnecessary alerts and data inconsistencies
- Built a digital platform with an AI virtual assistant that automates tasks, enables rapid information retrieval and delivers personalized interactions to improve employee satisfaction and engagement

SOFTWARE & HI-TECH

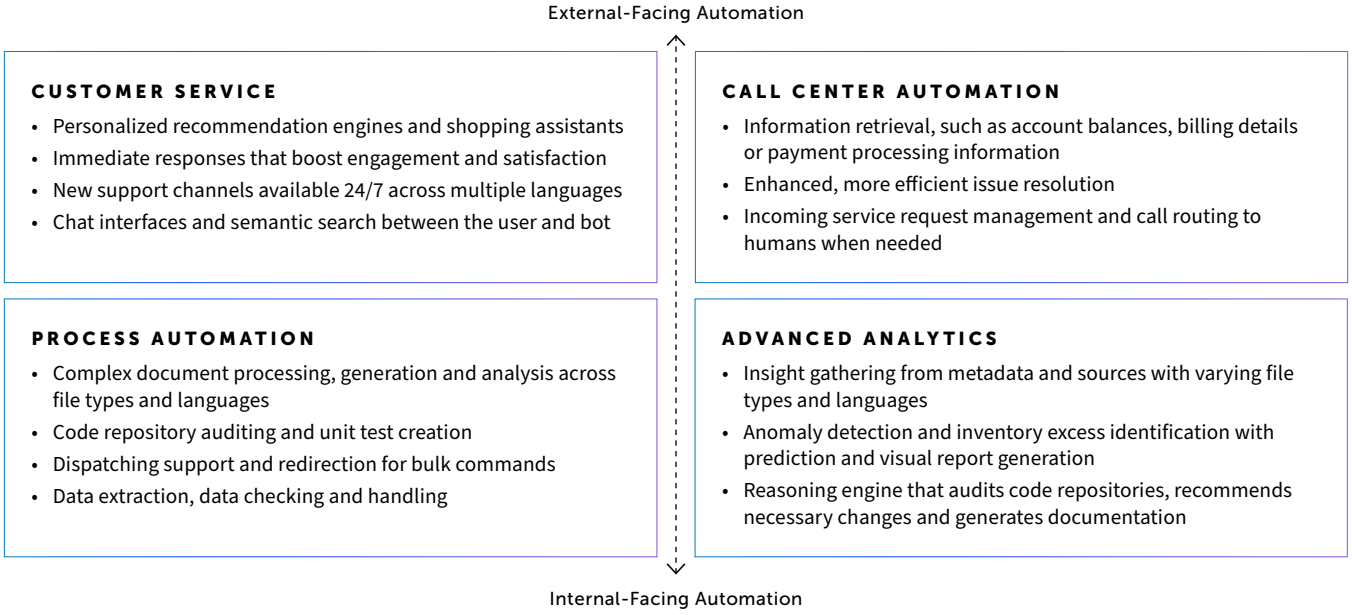
- Optimized an existing chatbot with a plan-and-execute agent that reduces the number of LLM calls needed per user query resulting in faster, more effective chatbot operations
- Improved QA productivity for a technology company by implementing an AI agent that updates test cases and automates tests, resulting in 30% less time spent on maintenance of scripts

TELECOM, MEDIA & ENTERTAINMENT

- Transformed an American telecom company's complex IVR system to an intelligent, AI-based contact center that improves operational efficiency and caller experience
- Helped a major gaming engine build an AI-powered tool that makes game creation faster and easier for developers

Functional Use Cases in Action

Here are some functional areas where we've implemented agentic AI use cases with our clients or within our own internal processes.



EPAM Accelerators & Expertise

Our accelerators and frameworks leverage GenAI and intelligent automation to enhance customer experiences, streamline software development and accelerate innovation.

- GenAI-native customer experience with agentic workflows
- Integration of customer standards into GitHub Copilot
- Assisted backlog through multi-agent architecture and RAG systems
- Agentic migration across major cloud service providers
- AI-powered service desk through intelligent automation
- AI Factory as a composable framework that enables multimodal products
- **JenAii™**, EPAM's virtual assistant powered by a combination of AI-enabled chatbots, motion capture and 3D gaming software
- **EliteA™**, a secure and advanced GenAI tool for enhancing the delivery process across the SDLC
- **ReportPortal**, a CI/CD tool that speeds product time-to-market with collaborative test automation
- **DIAL**, a unified GenAI orchestration platform that accelerates experimentation and innovation across public and proprietary LLMs, AI-native applications and custom add-ons
- **EPAM AI/Run™**, a product development methodology powered by AI that generates code, accelerates product ideation and supports multidisciplinary teams
- CodeMie, a tool designed to enhance software development processes by exploring an unfamiliar codebase and onboarding projects

How Can Enterprises Gain Long-Term Competitive Advantage?

Adopting agentic AI only works when you focus on fulfilling a business need, ground your approach in human-centric principles and apply sound engineering practices integrated across data, security, cloud and technology ecosystems, supported by a skilled talent pool and effective process governance. Otherwise, your investment will have been all for naught.

On this journey, executives run into large, complex challenges that require enterprise-wide alignment. These highly interconnected focus areas are make or break when it comes to scaling agentic AI.

ADOPTION & ORGANIZATIONAL BUY-IN

Developing agentic AI solutions at scale requires robust infrastructure, significant investment and coordination across departments. This demands that you balance pilot programs with scaling up enterprise-wide solutions effectively.

RETURN ON INVESTMENT

Demonstrating tangible ROI from agentic AI can be daunting. Many organizations face delays in seeing measurable outcomes, causing hesitation in further investment. You must focus on both immediate wins and long-term payoffs when building your strategy.

SCALABILITY & INFRASTRUCTURE

Scaling AI initiatives enterprise-wide while maintaining performance and reliability is critical, but difficult. You need to build a robust cloud, data and security infrastructure capable of supporting large-scale deployments, often under budget constraints and while coordinating across departments.

TECHNOLOGY INTEGRATION

Integrating agentic AI into existing IT ecosystems can be complex. Legacy systems and siloed architectures often create compatibility issues, increasing deployment time and costs. Modernizing systems that provide a solid AI foundation on which to build use cases while maintaining operational continuity is an essential balancing act.

DATA QUALITY, ACCESSIBILITY & MANAGEMENT

Agentic AI thrives on quality data, but ensuring data accessibility, accuracy and privacy is a significant hurdle. You must effectively manage vast and diverse datasets, giving your organizations access to clean, organized, protected and industry-specific information to train AI systems effectively.

SECURITY RISKS

Implementing agentic AI introduces new cybersecurity vulnerabilities, such as model hacking or data breaches. Building a **new security model** that covers attack vectors and fortifies defenses is a top priority to ensure operational resilience against evolving cybersecurity threats.

CHANGE MANAGEMENT

Driving an AI-first mindset across the organization demands a cultural shift. You'll need to establish programs that foster innovation and encourage teams to view AI as a partner rather than a threat.

TALENT ENABLEMENT

Skilled personnel who can develop, deploy and maintain AI systems are in high demand. Developing employee knowledge, skills, mindsets and new ways of working will enable change and agentic AI adoption.

PERFORMANCE MONITORING & OPTIMIZATION

Monitoring the performance of agentic AI systems and refining them over time is critical. Setting up robust evaluation frameworks adds operational complexity but brings the transparency and insight necessary to improve continuously.

ETHICAL & REGULATORY CONSIDERATIONS

The rapidly evolving AI landscape poses risks related to compliance with data protection laws and ethical AI practices, which can harm brand trust if mismanaged. You'll need to put **AI systems in place** that adhere to regulatory standards and ethical guidelines, especially regarding data privacy and algorithmic fairness.

Each part is a vital element to becoming a true AI-native enterprise. AI is a top-down initiative; without leadership at the helm, organizations cannot harness agentic AI. Enterprises that balance technology with enablement, vision with execution and automation with intelligence will be well-positioned to lead in the fast-evolving world of AI-driven transformation.

To capture the business value you seek, each focus area must work in harmony.

Mastering AI Automation Complexity

The path to modernization isn't straightforward; it's complex by design.

Every modern enterprise faces seismic shifts driven by new technologies, evolving customer expectations and fluctuating market dynamics. Thriving in this environment isn't about avoiding complexity — it's about mastering it.

When you conquer this complexity, you will not only champion agentic AI adoption, but you'll also gain endurance, resiliency and adaptability to quickly navigate future change.

To do so requires **expert orchestration across three core pillars**.

01

Business Origination with Technology Alignment

Scaling AI automation and agentic capabilities require more than technology — it demands a cultural shift and a strategic commitment to transformation. This can't happen in a silo — it demands seamless collaboration across teams, rigorous orchestration and an ecosystem approach. A successful agentic AI strategy must originate from real business needs and be designed with the end-user in mind, avoiding fragmented, one-off solutions.

To achieve this, you'll need to drive an AI-first mindset across the enterprise, establishing change management programs that foster innovation and encourage teams to see AI as a partner rather than a disruption. This cultural shift is essential to ensuring alignment and buy-in from all stakeholders. Equally vital is talent enablement. Developing the knowledge, skills and mindsets of employees will ensure the organization is equipped to create, implement and sustain advanced AI ecosystems.

Communication between business and technical teams remains paramount in this model — where business teams clarify goals and requirements while technology teams select and execute the appropriate automation frameworks. Together, they institute a feedback loop to align results with business objectives. Strong governance frameworks reinforce this alignment by defining guardrails for compliance and accountability, while centers of excellence share best practices for intelligent automation. By embedding change management and equipping the workforce, enterprises can drive agentic AI adoption efficiently, unlocking measurable business value and long-term success.

02

Foundational Infrastructure

Any cohesive strategy starts with a strong foundation – one that can effortlessly adapt to the shifting demands of the business landscape.

A single AI foundation offers enterprises a standardized framework to build diverse, scalable use cases while maintaining performance and reliability. This unified foundation acts as a guiding force, driving consistency across processes while ensuring new initiatives align with overarching business goals.

The complexity of acquiring, rationalizing and integrating automation tools into existing systems can't be ignored. Companies that have advanced API architecture with microservices as well as strong data ecosystems are better positioned to leverage agentic AI. It's essential to have a sophisticated integration architecture that orchestrates automated business rules and models, third-party data from APIs and agentic insights.

By reducing duplication, streamlining development efforts and connecting your spectrum of use cases across the enterprise, you can unlock more value from your AI investments, setting the stage for continued growth.

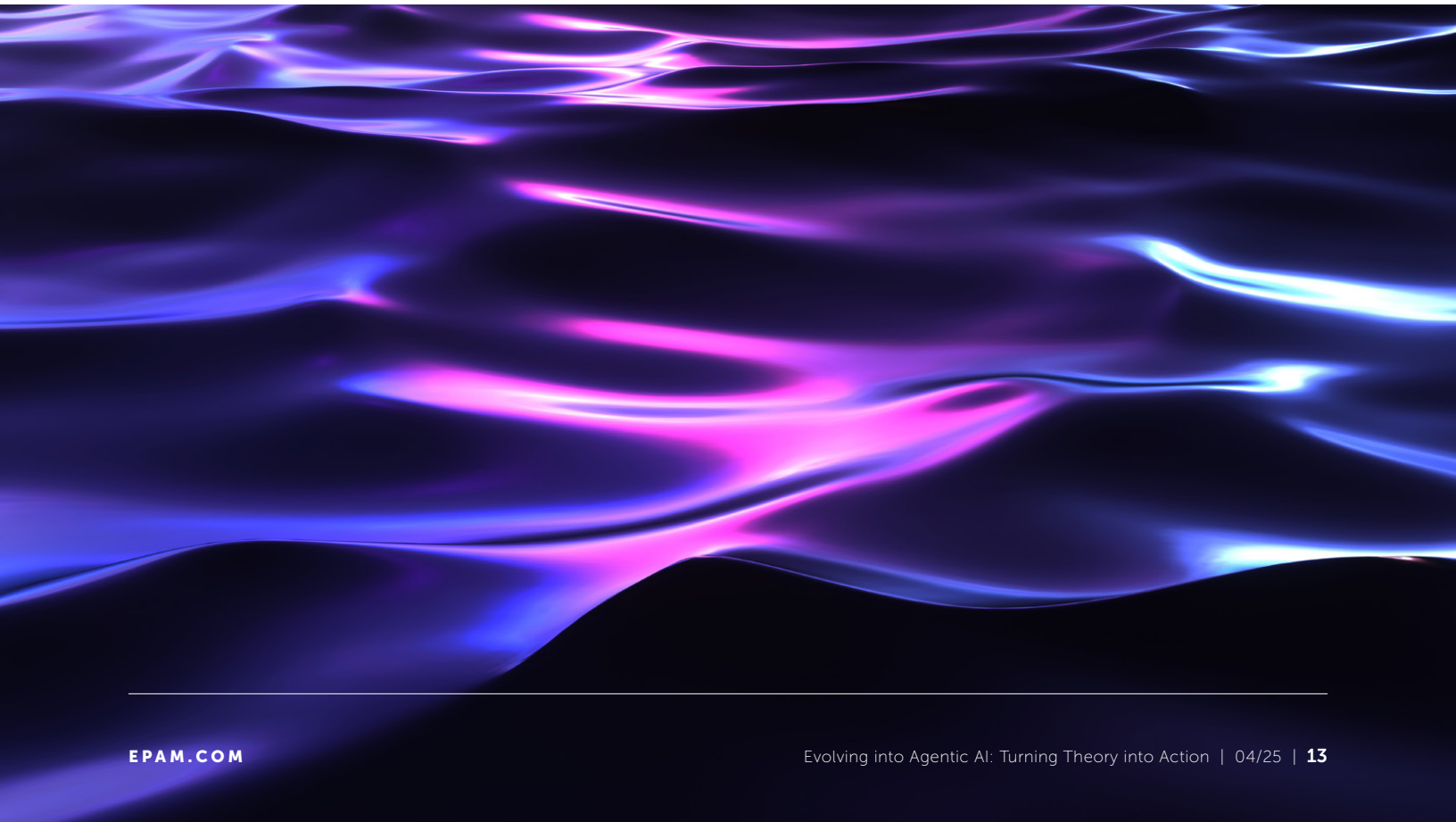
03

A Systems Thinking Approach

Systems thinking activates a network of interdisciplinary experts, working cohesively to address massive, ecosystem-level challenges. It's about recognizing that the enterprise is a system of interconnected parts — employees, technology, workflows — all of which must function in harmony.

This means blending diverse skill sets and aligning enterprise capabilities while embedding technology as a seamless part of that system. It's a collaborative effort that calls for visionary leadership who balance optimism with pragmatism and chart a path forward even in uncertain times.

When it comes to agentic AI, systems thinking is essential for scaling capabilities across the enterprise. True adoption of agentic AI requires more than implementing autonomous systems; it calls for **engineering excellence** to ensure precision, education to empower teams and interdisciplinary system design to align all moving parts.



Conclusion

At EPAM, we don't just deliver agentic AI — we design resilient ecosystems that weave automation, adaptability and actionable intelligence into the fabric of your operations.

Our approach bridges the technical and human aspects of transformation, for technology alone doesn't add value; it's people who are the real agents of change.

By fostering collaboration across disciplines, we orchestrate solutions that are both innovative and practical. With EPAM as your partner, agentic AI isn't just a technology upgrade. It's a strategic evolution driven by a systems-level perspective that ensures your enterprise not only keeps pace, but leads in a world defined by change.

Ready to chart your agentic AI journey? Let's define your roadmap for immediate wins and long-term outcomes.

To learn how EPAM can help, please contact us.

About EPAM Systems

Since 1993, EPAM Systems, Inc. (NYSE: EPAM) has used its software engineering expertise to become a leading global provider of digital engineering, cloud and AI-enabled transformation services, and a leading business and experience consulting partner for global enterprises and ambitious startups. We address our clients' transformation challenges by fusing EPAM Continuum's integrated strategy, experience and technology consulting with our 30+ years of engineering execution to speed our clients' time to market and drive greater value from their innovations and digital investments.

We make GenAI real with our AI LLM orchestration, testing and engineering solutions, EPAM DIAL, EPAM EliteA™ and EPAM AI/RUN™, respectively.

We deliver globally, but engage locally with our expert teams of consultants, architects, designers and engineers, making the future real for our clients, our partners and our people around the world.

We believe the right solutions are the ones that improve people's lives and fuel competitive advantage for our clients across diverse industries. Our thinking comes to life in the experiences, products and platforms we design and bring to market.

Added to the S&P 500 and the Forbes Global 2000 in 2021 and recognized by Glassdoor and Newsweek as a Top 100 Best Workplace, our multidisciplinary teams serve customers across six continents. We are proud to be among the top 15 companies in Information Technology Services in the Fortune 1000 and to be recognized as a leader in the IDC MarketScapes for Worldwide Experience Build Services, Worldwide Experience Design Services and Worldwide Software Engineering Services.

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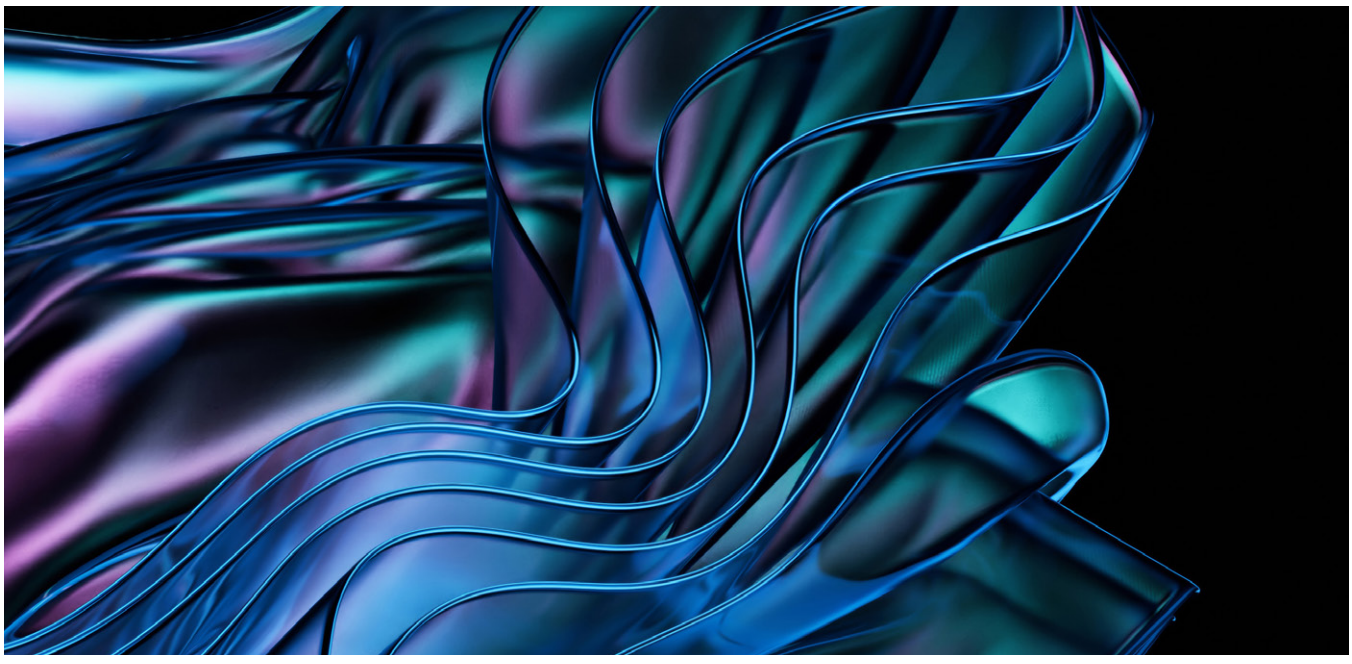

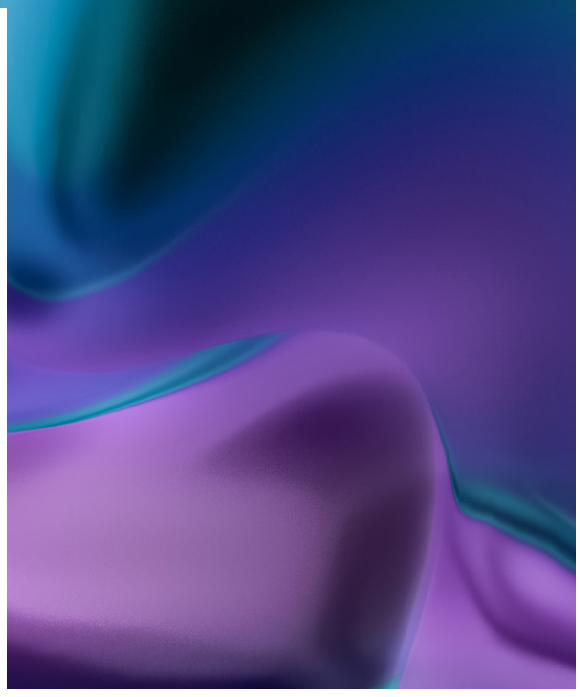

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