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EXECUTIVE SUMMARY

Accelerating Agent Development with Amazon Bedrock AgentCore

AUTHOR

Mitch Lewis
Performance Analyst | Signal65

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Challenges of Agentic Development

Agentic AI presents enterprises with a significant advancement over basic Large Language Models (LLMs), enabling autonomous applications that can perceive, reason, plan, and execute actions by leveraging functional tools. This capability transforms AI into a practical enterprise automation tool to solve complex, real-world problems. However, developing and deploying these agents involves considerable complexity. Practitioners must select appropriate models and agentic frameworks, while also addressing critical challenges related to security, integration with existing systems, scalability, and the robust monitoring of intricate agent behavior. The lack of standardized, purpose-built development toolkits often forces developers to spend extensive time on infrastructure and custom solutions, ultimately delaying the time-to-production and hindering the realization of agentic AI's full business value.

Accelerating Agentic Development with Amazon Bedrock AgentCore

Amazon Bedrock AgentCore gives developers a flexible, modular toolkit and a comprehensive agentic platform to rapidly accelerate the development and deployment of AI agents, while providing enterprise grade security and scalability. To evaluate the efficiencies gained by utilizing AgentCore, Signal65 engineers developed three distinct example agents, outlined below:

- **Customer Service Agent:** A friendly customer service chatbot capable of providing product information and customer assistance.
- **Operations and Product Management Agent:** An AI agent that monitors and interacts with external project management tools to enhance project management efficiency and escalate issues.
- **Market Research Agent:** A useful automation agent that conducts market research by browsing specified web domains to collect information and answer specific research questions.

Each agent was built twice: once utilizing Amazon Bedrock AgentCore – a fully managed deployment, and again with an approach assembled from separate tools and services, referred to as a "custom deployment" [1], requiring customers to use several disconnected tool sets and invest significant manual effort. All development time was recorded for both approaches, ultimately finding AgentCore to be significantly more efficient:

2.1x Faster End-to-End Agent Development

75% Less Time Spent on Infrastructure and Integrations

5.2x Faster Cloud Deployment

Key Findings

Build Agents Faster

Throughout this evaluation, Signal65 found that utilizing Amazon Bedrock AgentCore dramatically reduced the time, complexity, and effort involved in building and deploying AI agents compared to the custom deployment. In total, Amazon Bedrock AgentCore enabled:

1.8x
faster end-to-end development of the Customer Service Agent [1]

1.68x
faster end-to-end development of the Operations and Project Management Assistant [1]

2.9x
faster end-to-end development of the Market Research Assistant [1]

Across the three example agents, six of the generally available AgentCore services were utilized, each of which provided unique advantages and greater efficiency than alternative methods used in the custom deployment method. The most notable efficiency gain was found in utilizing Amazon Bedrock AgentCore Runtime to deploy both agents and MCP servers to the cloud. With AgentCore Runtime, cloud deployment was found to be **5.2x faster**[1] than a custom deployment, with the entire process achievable in only four lines of code[1].

Other key increases in efficiency were also found throughout the development process with other AgentCore services. Amazon Bedrock AgentCore Memory enabled **9x greater efficiency**[1] when providing agents with key memory capabilities to support agents with ongoing conversation history. Similarly, the Amazon Bedrock AgentCore Built-In Browser tool provided web browsing capability for the Market Research Agent **7x faster**[1] than building a custom browser implementation.

Flexible, Scalable, and Secure

During the development process, the flexibility, scalability, and security of AgentCore emerged as key advantages. With Amazon Bedrock AgentCore Runtime, the example agents were securely deployed to AWS with complete session isolation and the ability to scale up to thousands of concurrent sessions. By further incorporating Amazon Bedrock AgentCore Identity, and Amazon Bedrock AgentCore Gateway, agents were securely equipped with various external tools, including seamless integration with existing lambda functions via MCP.

AgentCore additionally provides flexibility through its modular approach to agentic development, enabling developers to leverage any of the AgentCore services that best suits their needs, alongside any agentic frameworks and models.

Maximize Developer Resources

By utilizing Amazon Bedrock AgentCore, far less time was spent dedicated to configuring the supporting integrations and infrastructure. In total, Signal65 found **that AgentCore reduced this time by 75%** compared to the custom deployment.

By reducing the time spent on these tasks, Amazon Bedrock AgentCore empowers developers to make more efficient use of their time – focusing on building functional tools that add real business value to their agents.

Greater Efficiency, Simplified Development, and Increased Business Value

Throughout the development of three distinct agentic use cases, this evaluation demonstrates the broad increases in efficiency that AI developers can achieve by utilizing Amazon Bedrock AgentCore. For enterprises with strategic AI initiatives, simplified development and increased efficiency translates into tangible benefits with real business value, including faster time to value, quicker iteration, and greater overall innovation.

Metric	Impact	Business Value
Developer Productivity	**2.1x increase**[1]	Deploy 2x more agents with same sized team
Time to Production	**50% reduction**[1]	Enable valuable business automation in half the time
Infrastructure Overhead	**75% reduction**[1]	Reallocate developer resources to innovation and business value
Deployment Speed	**5.2x Faster**[1]	Rapid iteration with secure cloud scaling
Operational Complexity	**Minimized**[1]	Serverless, managed infrastructure

Important Information About this Report

CONTRIBUTORS

Mitch Lewis
Performance Analyst | Signal65

PUBLISHER

Ryan Shrout
President and GM | Signal65

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Signal65 is a leading research organization specializing in enterprise AI infrastructure optimization and deployment strategies. Our lab focuses on evaluating and optimizing AI hardware and software solutions for real-world enterprise applications, with particular expertise in large language models, retrieval-augmented generation systems, and distributed AI architectures.

For more information, visit signal65.com
or contact research@signal65.com

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CONTACT INFORMATION
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