Thrive in the Digital Era with AI Lifecycle Synergies

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IDC ANALYZE THE FUTURE

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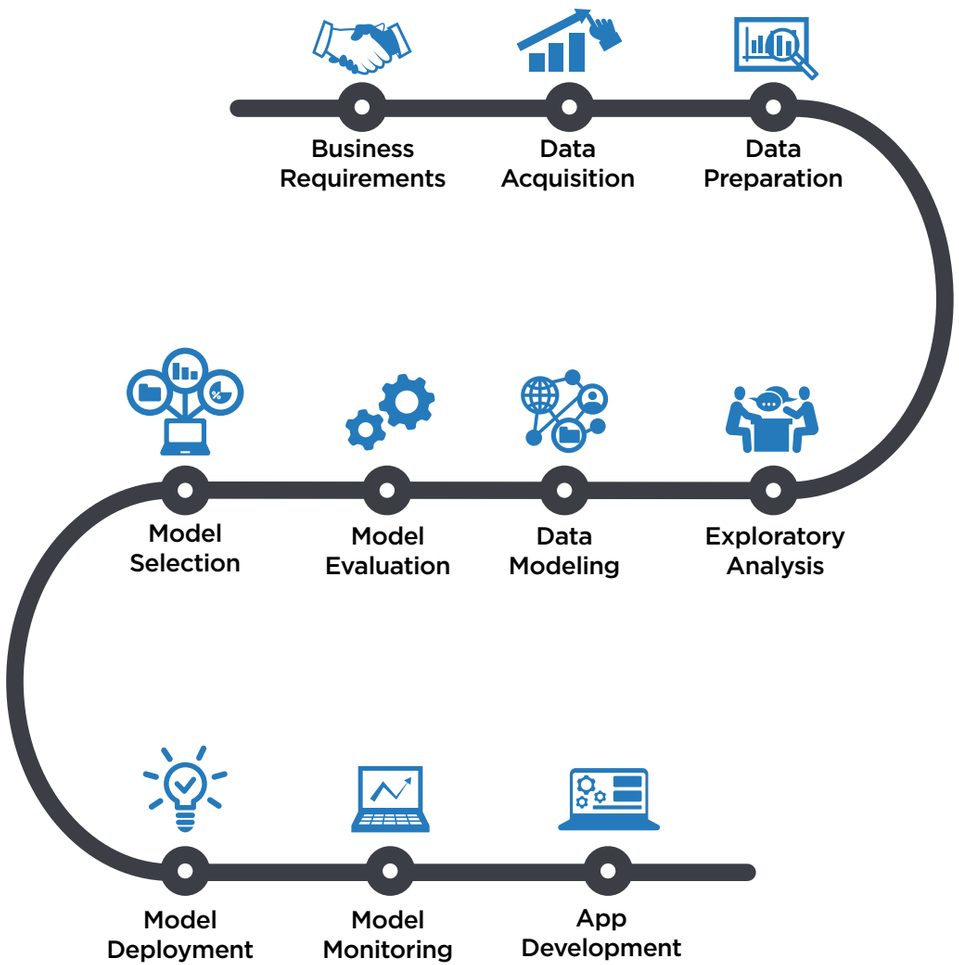
Executive Summary

An End-to-End Solution is Paramount

Artificial Intelligence is at the heart of digital disruption across nearly every industry. **By 2024, with proactive, hyperspeed operational changes and market reactions, artificial intelligence (AI)-powered enterprises will respond to customers, competitors, regulators, and partners 50% faster than their peers.**

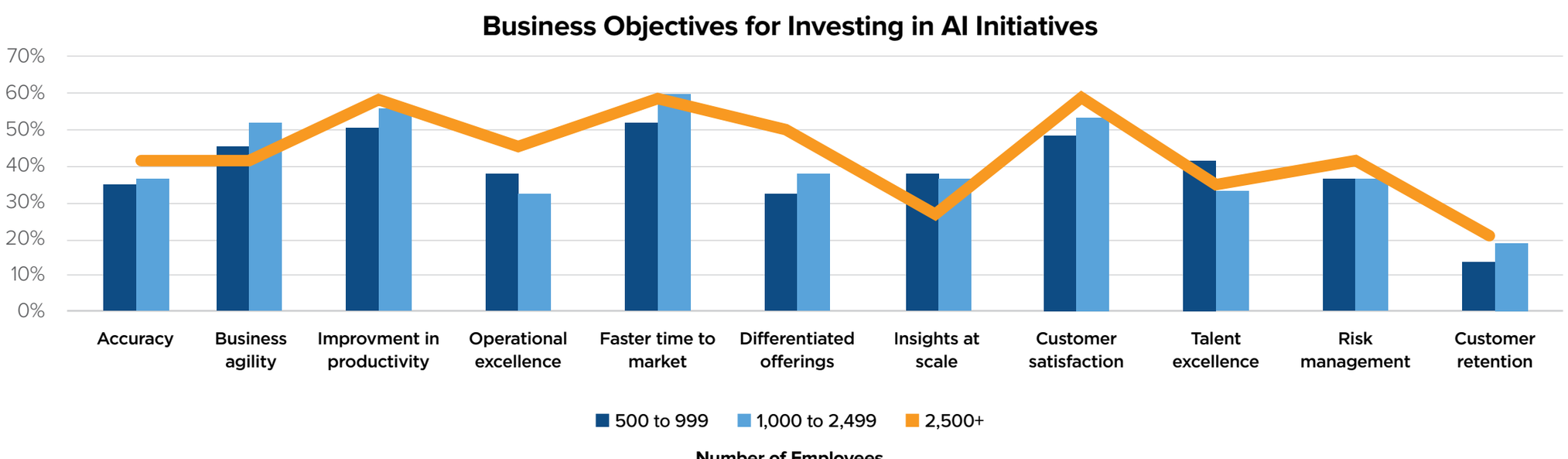
IDC forecasts that global AI spending will reach **$97.9 billion by 2023.** As per IDC research, AI adoption is low but at a tipping point. Data quality, quantity and access, algorithm explainability and selection, lack of data science skilled personnel and cost of AI solutions are the key factors holding back AI initiatives. Only one tenth of PoCs reach to production deployments and about half of the AI initiatives fail. Businesses' report more than 50% of the time on an AI project is spent on data integration and management and solution deployment vs actual data science tasks. An end-to-end solution covering all aspects of an AI lifecycle is crucial to an organization's road to AI adoption and faster realization of superior business outcomes.



Customer Satisfaction, Faster Time to Market and Improvement in Productivity

The Top 3 Business Objectives for Investing in AI Initiatives

Organizations' business objectives for investing in AI initiatives are balanced between tactical and strategic priorities. While larger organizations gravitate more to customer satisfaction, "faster time to market" is a higher focus for smaller organizations.

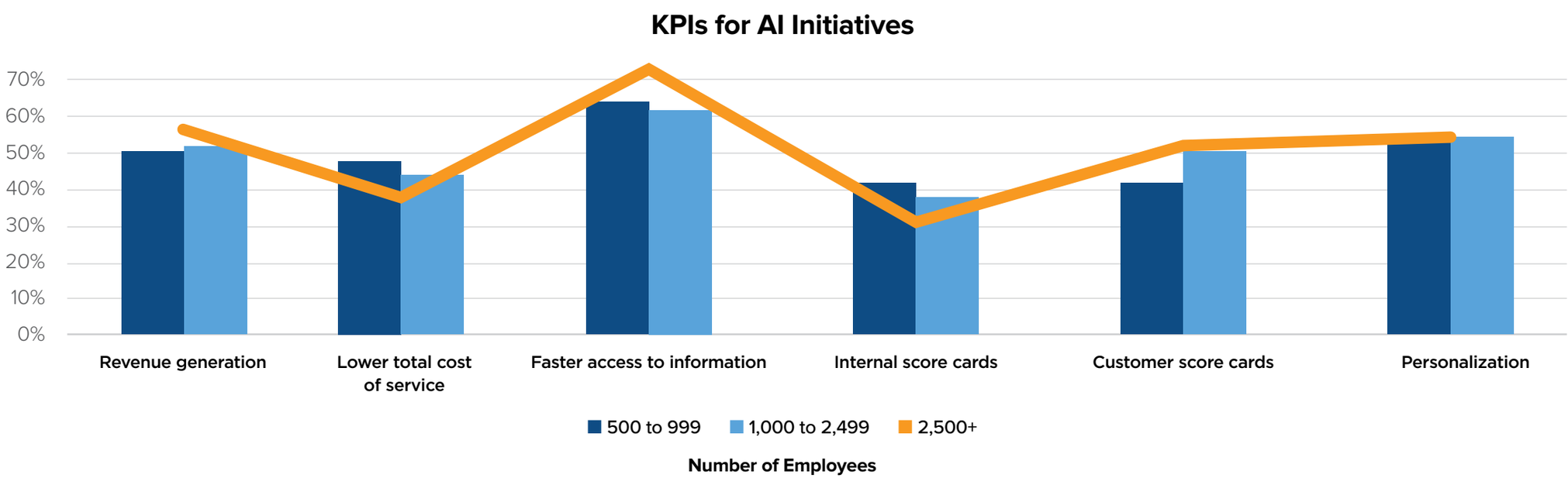


N= 115 (500-999 employees); N= 85 (1000-2499 employees, N=50 (2500+)
N = 250; US; Source: Oracle AI DS Lifecycle Market Survey (DSLC), IDC, August 2019

Faster Access to Information, Revenue Generation and Personalization

The Top 3 Key Performance Indicators for AI Initiatives

AI solutions are only as effective as their key performance indicators (KPIs). Organizations must track KPIs and look for solutions that bring them closer to adding specific value to their businesses. Knowing that you want AI, but not knowing why you want it — you will fail AI, and AI will fail you. Faster access to information enables business agility and continuous competitive advantage.



N= 115 (500-999 employees); N= 85 (1000-2499 employees, N=50 (2500+)
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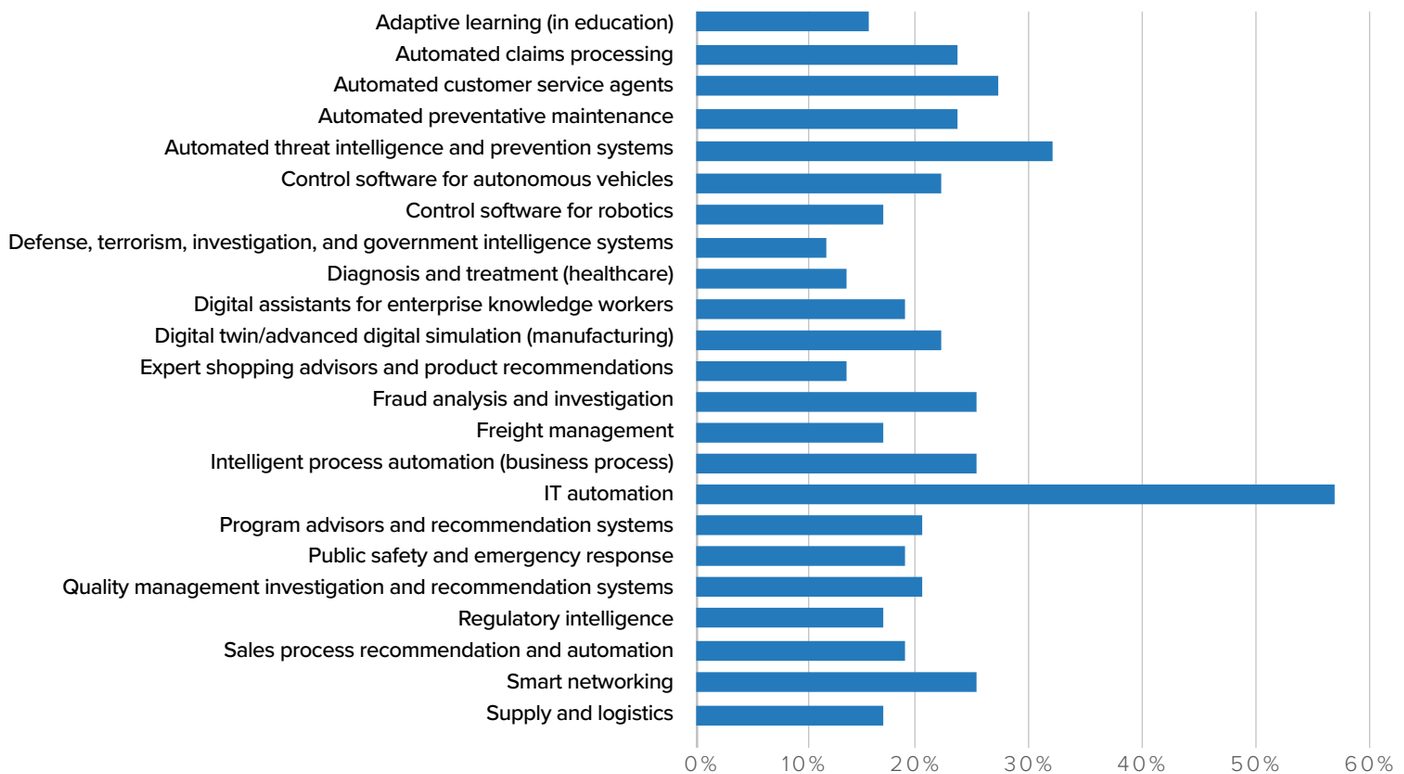
IT Automation Is by Far the Top Use Case for Build out of AI Applications

AI will permeate every IT function. It is being used to provide self-configurable, self-healing and self-optimizing infrastructure and data management that help prevent issues before they occur, improve performance proactively and optimize available resources.

Other interesting applications are resolving employee's tech support issues, automating the task of implementing new systems or new applications to help improve enterprise productivity, managing risks and driving overall cost reduction.



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Top Drivers for Using Machine Learning as a Service Platform

IDC expects in-house development to be limited to a few use cases

Businesses choose MLaaS to harness the processing power of machine learning hosted in the cloud — eliminating excess time, costs, and risks inherent in building on-premise solutions. MLaaS provides instant access to data and to any size compute for any size project. Businesses can scale to massive size GPUs instantly, unlike on-premise deployment where they compete for resources.

ML platforms also provide simplified development and lower operational costs because data scientists can work from a centralized, governed, project-based environment, rather than having data scientists using a smattering of open source tools and having to work to support and manage a variety of environments.

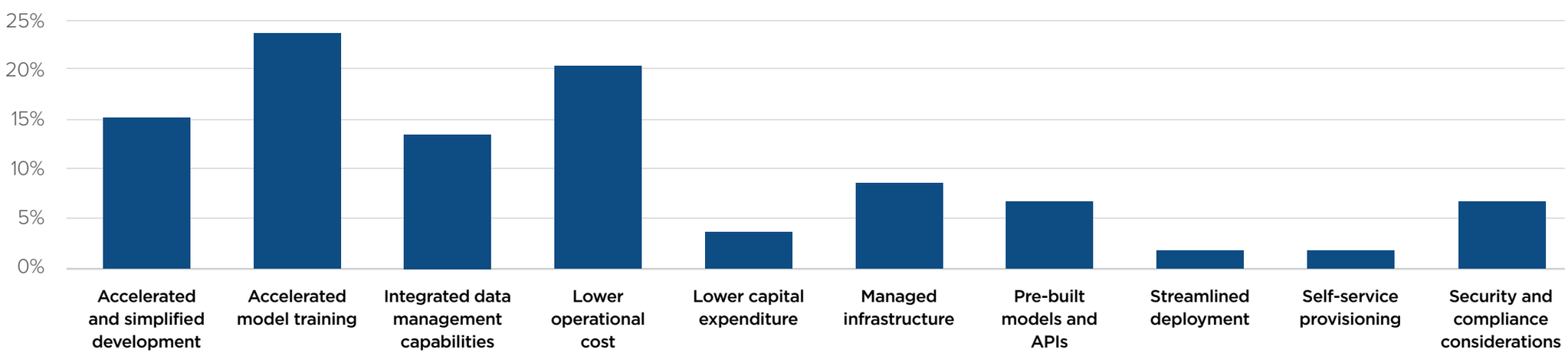
N = 250; Source: Oracle AI DS Lifecycle Market Survey (DSLC), IDC, August 2019

Top Drivers for Using Machine Learning as a Service Platform (continued)

MLaaS drastically cuts operational costs by only charging subscribers for time or space used — unlike traditional development which requires large, upfront investments that go mostly unused until fully ramped-up. It provides major competitive advantage by providing pre-built algorithms, scalable data management and verified data analytics.

MLaaS tends to be more secure than on-premise solutions because providers must adhere to all governances and regulations, perform frequent vulnerability tests, and employ top security experts.

Top Drivers for Using Machine Learning as a Service Platform



N = 250; Source: Oracle AI DS Lifecycle Market Survey (DSLC), IDC, August 2019

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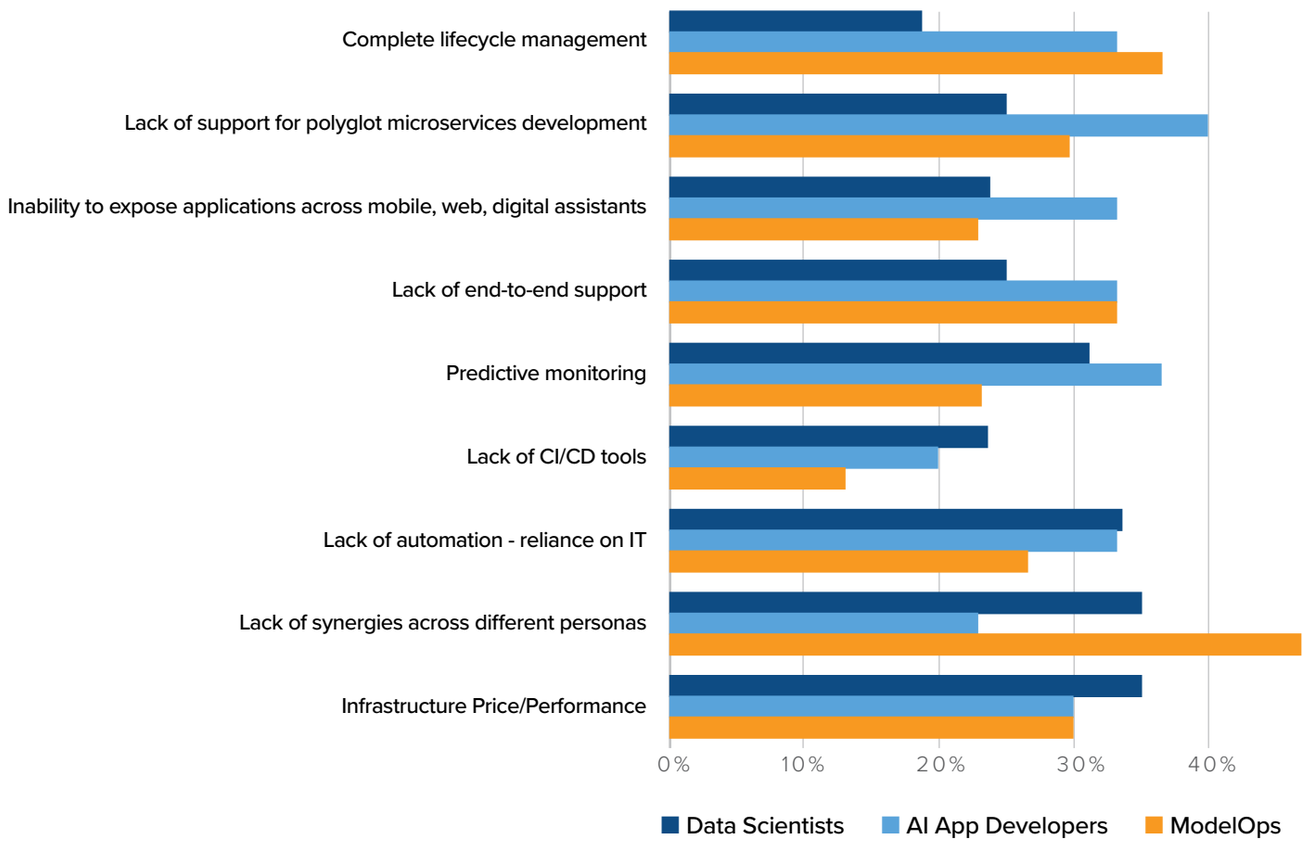
End-to-End Lifecycle Management Challenges

Lack of synergies across different personas, infrastructure price/ performance, security, lack of automation and lack of support for polyglot microservices development are the top challenges. While lack of automation and synergies across the model development lifecycle is a bigger challenge for small and medium sized companies, predictive monitoring is key for larger companies. Complete lifecycle management is an important challenge for ModelOps and AI app developers while reliance on IT is challenging for data scientists.



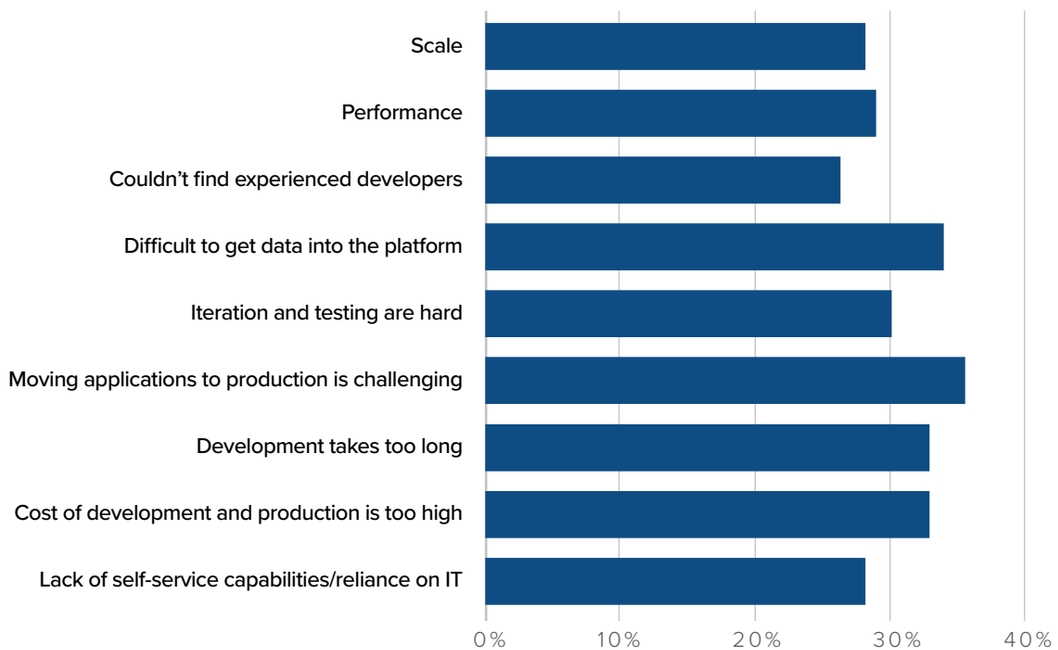
N= 80 (Data Scientists); N= 30 (AI App Developers), N=30 (App developers)
N = 140; US; Source: Oracle AI DS Lifecycle Market Survey (DSLC), IDC, August 2019

Top AI Model Development Challenges

The AI/ML lifecycle is driven by the volume, velocity, variety and veracity of data. AI models are not the same as applications. Patterns of data drift impact models' efficacy, driving the need to train/re-train/re-deploy. Current data integration and DevOps tools and methodology are limiting.

Businesses need to empower data scientists/engineers with self-service capabilities that help data integration safely and embrace MLOps to accelerate AI applications deployment.

Organizations' Challenges in Model Development & Deployment



N = 250; Source: Oracle AI DS Lifecycle Market Survey (DSLC), IDC, August 2019

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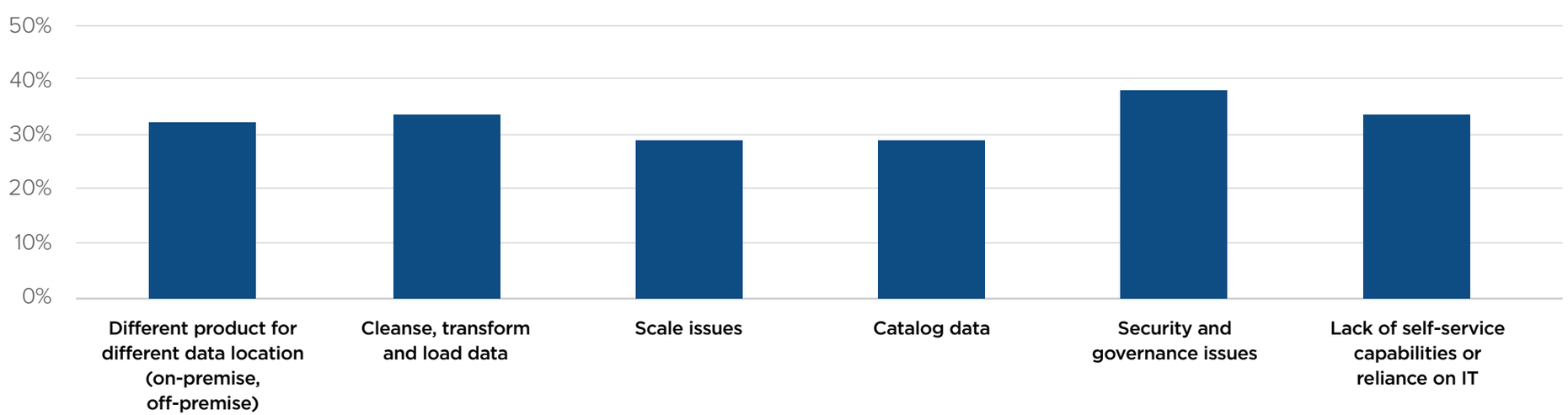
Data Integration Challenges

Organizations need to utilize ML-powered data catalogs to make data discovery easier for data engineers and allow IT to enact controls to ensure data security. ML-powered data catalogs allow companies to use ML to profile, categorize, and collaboratively maintain data assets for training the models, while providing necessary governance and access control and eliminate manual metadata management.

Without a data catalog, the only other way to show what data the organization has in order to ensure it's properly governed for General Data Protection Regulation, HIPPA, and other regulations is to catalog it manually, which is an impossible undertaking for today's petabyte enterprises.



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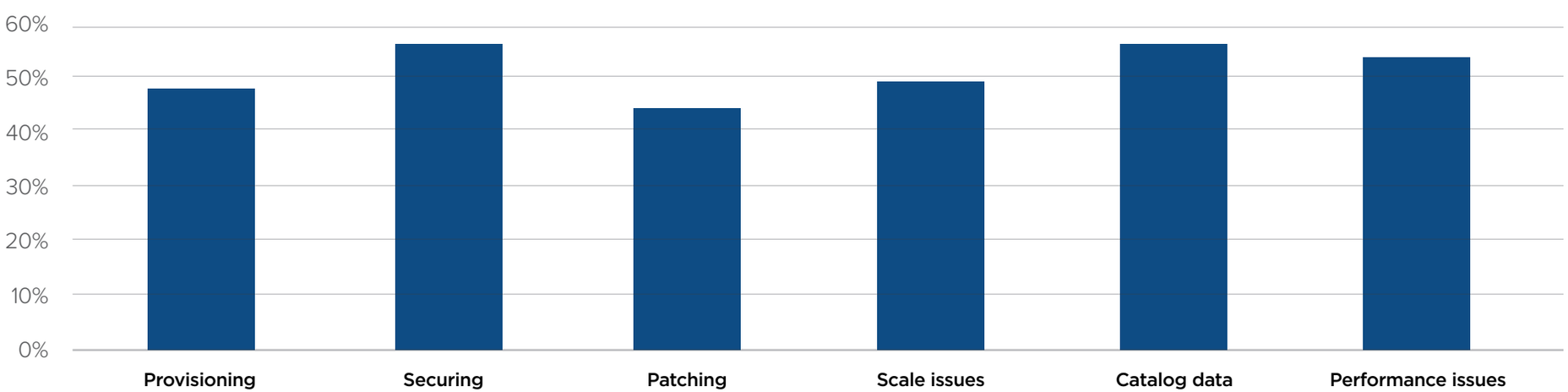
Data Management Challenges

Creating a new large-scale database could take weeks if new hardware needs to be procured and installed in a customer's datacenter. A database/analytics system needs continuous tuning for optimal performance as data sets grow exponentially and the workloads' characteristics change over time.

Uptime of a system has direct correlation to realization of business value. Patches, upgrades and security fixes need to be applied automatically without downtime. Businesses need to adopt autonomous data management systems first, to lower operating costs by reducing expensive and tedious manual administration, and second, to improve service levels through automation and fewer human errors.

Once data is managed, it's important to have a data catalog so analysts and data scientists can find the data they need easily.



N = 250; Source: Oracle AI DS Lifecycle Market Survey (DSLC), IDC, August 2019

Customer Value: Accelerated ML Innovation & Competitive Advantage

Oracle's Data Platform for Machine Learning is an open and integrated solution for every member of your team to build AI-driven applications at enterprise scale. Integrate and manage any data format for machine learning, easily catalog and access that data, and collaboratively build machine learning solutions using the best of open source technologies.

Accelerate data integration

Manage & catalog ALL data for machine learning

Collaboratively build machine learning models

Oracle's Data Platform for Machine Learning supports individuals with different skill sets and responsibilities across every step in the machine learning lifecycle.

Oracle's Data Platform for Machine Learning

Customer Value: Accelerate Data Integration

Oracle Data Integrator: Provides high performance bulk data movement, massively parallel data transformation using database or big data technologies, and block-level data loading that leverages native data utilities. This platform is optimized for the Oracle Autonomous Data Warehouse and supports new cloud workloads, existing environments, and hybrid workloads.

Oracle GoldenGate: A single tool that simplifies data replication and sharing between heterogeneous data sources and targets for faster information access. The GoldenGate Microservices Architecture provides RESTful APIs which lets you manage data replication in hybrid cloud environments for improved productivity.

Oracle's Data Platform for Machine Learning

Customer Value: Manage & Catalog All Data for Data Science Workflows

Oracle Autonomous Data Warehouse: Provides an easy-to-use, fully autonomous database that scales elastically, delivers fast query performance and requires no database administration. Whether you are providing self-service access to all data, building an analytical data mart, or transforming analytics with machine learning, the Oracle Autonomous Data Warehouse is an industry-leading data warehouse solution for any size organization

Oracle Big Data Service: An OCI native automated service that provides a high-powered environment tailor-made for advancing businesses' analytical and machine learning capabilities. With automated lifecycle management and one-click security, Oracle Big Data Service is designed to optimally and securely run a wide variety of big data workloads and technologies while simplifying operations.

OCI Data Catalog: A single collaborative environment for data professionals to collect, organize, find, access, understand, enrich and activate technical, business and operational metadata to support self-service data discovery, advanced analytics and governance for trusted data assets in Oracle Cloud and beyond.

Oracle's Data Platform for Machine Learning

Customer Value: Collaboratively Build Machine Learning Models

Oracle Cloud Infrastructure Data Science Service: A governed, project-based workbench that enables data science teams to collaboratively build, train, deploy, and manage machine learning models using their favorite open source tools. The platform enables data scientists to quickly access the data and computing resources they need for any size project and check their code in and out of their organization's Git repository for version control and preservation. The platform makes data science teams more productive, decreasing time to value, and ultimately creating a more robust business, powered by machine learning.

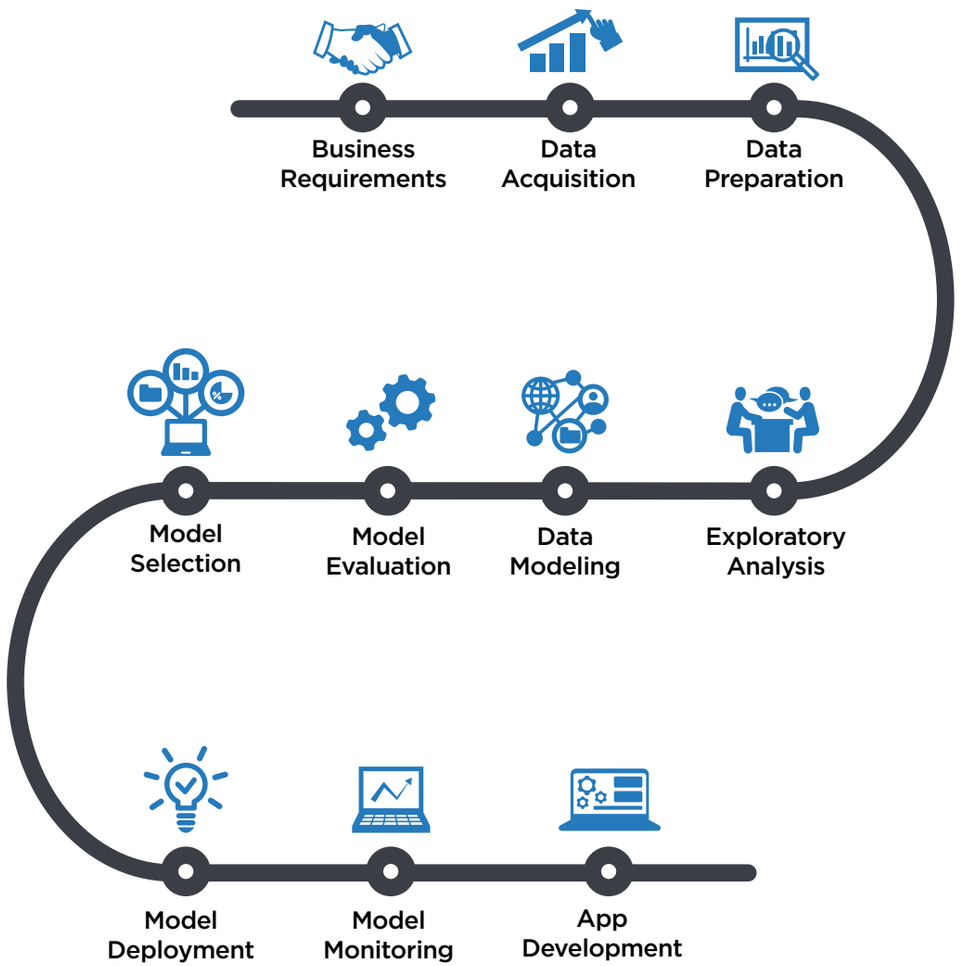
Oracle Machine Learning: A suite of complementary components and development platforms that support scalable machine learning (30+ algorithms) for 100% in-database processing and big data environments. With Oracle Machine Learning, Oracle processes the data where it resides—minimizing or eliminating data movement- achieving scalability, preserving security, and accelerating time-to-model deployment.

Conclusion

Artificial Intelligence is transforming every aspect of our daily lives. It can be very tempting to dive headlong into data science and AI initiatives. However, it can be difficult to make headway without first understanding the importance of data management. Remember — AI is data-driven. You can't do anything with AI or machine learning without data, so you must ensure that you understand and manage the lifecycle of that data. When your data is managed properly, AI can absolutely transform the abilities and possibilities for an organization.

There is a shortage of data scientists. In response to this gap, explore methods to enable data science work to be more self-service and efficient. One avenue is through a machine learning platform to enable data scientists to more easily work together, access compute and resources in a self-service manner (i.e., without bugging IT), and build, train, and deploy models without as much reliance on engineering and other teams.

Lastly, ensure you embrace the practice and discipline of collaboration across data engineers, data architects, data scientists, AI app developers and ModelOps personas. Exploit the power of cloud infrastructure to help streamline workflows for teams, support easy access to data, and ensure consistent performance along with microservices-oriented development in a secure and governed fashion.



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