The information edge

How PE firms can turn data science into a competitive advantage

To win in the current market, PE firms need an edge. For many companies, data science and machine learning are uncovering new insights about potential sources of value for both targets and portfolio companies — providing the edge they need for bidding and successful post deal execution. The time for PE firms to realize the benefits of data science is now. Firms that do not employ data science risk being left behind.

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In today's fast-paced M&A environment, deal making is increasingly a challenging task. Competition is only increasing as private equity (PE) firms, strategics, and other investors aggressively vie for the most attractive targets. By the middle of 2018, PE firms globally had a record of 1.2 trillion US dollars in committed yet undeployed capital ("dry powder"), with many noting plans to raise additional funds[1].

While PE firms are focused on targeting the right potential investment opportunities, they are also more focused than ever on finding new ways to maximize growth of existing assets. With the increasing speed, sophistication, and unorthodox visionaries in the market, the margin for error continues to tighten. Smarter decision making and more efficient asset growth methods are requirements in today's market.

To enhance competitiveness and deal outcomes, PE firms need an edge — an information advantage. Using data science methods, highly trained data scientists can integrate more data from a wider variety of sources and use sophisticated models to identify insights and opportunities that standard data analysis simply cannot offer — and they can do it at deal speed.

Data science can help PE investors to have the confidence to validate and "defend" the investment thesis and cash flow sustainability. More importantly, other firms are using such information in an "offensive" mode that uncovers hidden value levers for a potential target or existing portfolio asset. In this market, data science tools and techniques can be the difference.

The firms that are taking advantage of the opportunities presented by data science are already realizing game-changing benefits. They are justifying high-winning bid prices in competitive contexts — knowing they can reduce the multiple through enhanced growth opportunities and performance improvement within their portfolio. Those that do not embrace data science quickly will likely be at an information disadvantage and risk competitiveness and, potentially, returns over the long term. The question is: How does a PE firm move from the status quo to a data-driven approach that will deliver real results throughout the M&A lifecycle?

PE funds that understand how 1) data science is transforming the deal business; 2) the impact that data science can provide pre deal, post deal, and pre sale; and 3) how to integrate this ground breaking approach into their process will be well positioned to win even as the market continues to shift.

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[1] Prequin Report – "Private Capital Dry Powder" Factsheet (June 2018)

The emergence of data science in PE

Data science is not a new discipline in business. Insurance companies have been using advanced data techniques for decades. Social media companies use data science for everything from facial recognition in user photos to micro targeting ad messaging.

Historically, using data science in PE was not considered feasible for several reasons:

— The data necessary for complex deal analysis was not readily accessible.

— Software to effectively process the data was not available.

— Data scientists were not integrated into the deal process.

— Analysis could not be done in the short timeframes demanded by the deal context.

Over the past five years, the opportunity landscape for bringing data science into the deal process has changed dramatically. Advanced capabilities such as cloud computing, open-source software, and greater access to trained professionals have made it possible to quickly analyze various massive data sets in a tightly time-bound deal context. PE firms now have the opportunity to implement sophisticated methods of analyzing data to uncover value both pre- and post deal.

What is data science?

Data science is a multidisciplinary approach that brings together scientific thinking, statistical methods, computer engineering, and innovative technologies to collect, combine, and assess significant amounts of structured and unstructured data in ways that can provide better insights and predictions to help answer business questions and drive strategic decisions.

Scientific thinking

Innovative technologies

Data science

Statistical methods

Computer engineering
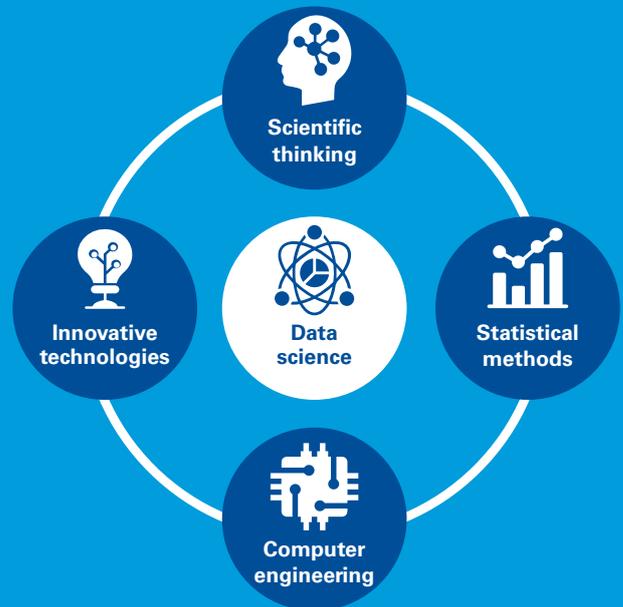
The convergence of four factors is opening up new ways to identify new opportunities value for PE firms.

Talent

Data scientists with advanced skills in engineering, computer science, and math are now partnering with deal experts to translate business data and models into new insights that can drive decision making.

Technology

While traditional PE firms continue to rely on Excel-based analysis, new tools can now be used to rapidly assess massive data stores to provide deeper insights.

Types of data

Data from third-party sources is being integrated with corporate information to conduct richer analyses into the wider market context. Examples of external data might include historical and forecasted market data, industry benchmarks, economic outlooks, population and demographics data, aggregated location data from smartphone apps, satellite data, phone usage data, data from social media sites, and others. These new data sources allow for more advanced data models and better predictive analysis.

Techniques

Artificial intelligence (AI) and machine learning programs can be used to build predictive models that learn through cycles of data continually improving accuracy. This can be done during the pre deal diligence phase to test and refine hypotheses or post close to support ongoing business decision making.

According to KPMG's research (Exhibit 1), there are a handful of larger PE firms that have already implemented or are currently exploring the use of Big Data and cognitive computing and machine learning. Most firms are still in the "awareness raising" phase, which indicates a real opportunity to gain an advantage for the firms that act quickly. Data science can give PE firms a myriad of ways to assess potential deals, predict ROI based on shifting levers, and adjust their change activities over time.

Exhibit 1: Where do private equity firms stand in their journey?

Most surveyed firms are still in the "awareness raising" phase with respect to the eight key digital innovations.

	Awareness raising	Close to decision making	Implementation
Big data	70%	12%	18%
Cognitive computing and machine learning	88%	6%	6%
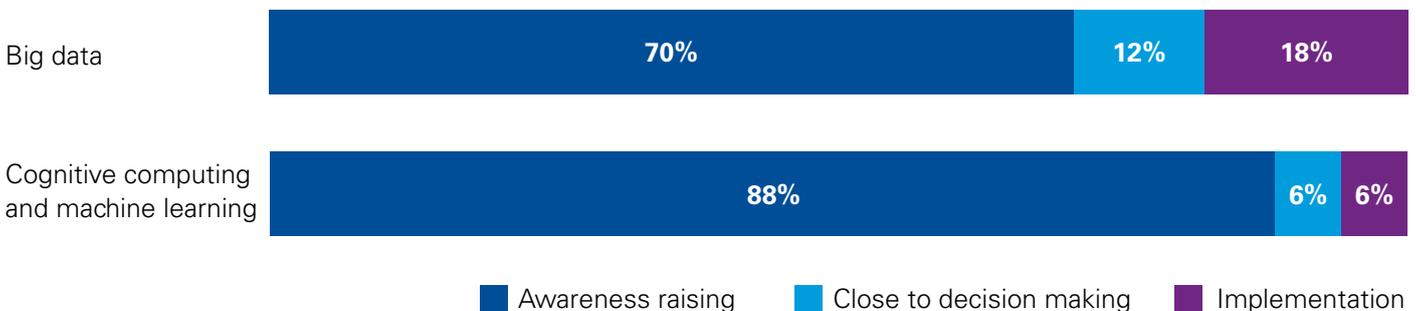
All figures add to 100%

Source: KPMG International, "KPMG/Create — Research survey" (2018)

Leveraging the data advantage to win the bid

PE firms can use data science to delve deeper into the data provided by specific targets and combine these insights with external data sources. With advances in technology and processes, these insights can now be gained at deal speed. This will help PE firms build a more comprehensive and accurate picture of their target's growth opportunities and potential performance improvements.

By using data science, PE firms can uncover potential value levers related to identified deals that might not be obvious in order to make more competitive deal decisions.

Identifying growth opportunities pre deal through data science

Establishing a winning valuation requires a clear picture of the threats and opportunities of a target's business model.

— What is the target's position among its competitors in the market?

— Are the sales, marketing, and customer success functions operating efficiently and effectively?

— What products, value propositions, and brands are underleveraged in the market?

These questions and many others are key to understanding potential growth opportunities. While traditional due diligence analysis tries to answer these questions at a high level, applying data science can quickly identify a range of hidden market signals and more accurately predict how specific actions or events will alter growth forecasts. Uncovering these insights can provide a definitive advantage in competitive bid situations.

Data science can be used to identify a wide range of potential growth opportunities.

Growth opportunities

Sales

— Marketing funnel conversion

— White space/ expansion opportunities

— Historical pipeline conversion

— Sales force effectiveness

— Lead scoring

— Indirect channel effectiveness

Customer

— Customer lifetime value projection

— Enhanced customer retention

— Recurring revenue

— Customer sentiment

— Revenue leakage analytics

Product

— Product usage patterns

— Intellectual property assessment

— Product portfolio profitability

— Fully costed profitability

— Plant profitability

Pricing

— Local market pricing analysis

— Price architecture

— Price/promotion optimization

Examples of growth levers in action

Market opportunities: Market opportunities can be identified and vetted on a multidimensional scale by combining data sets that capture broad-based views of a particular market. For example, internal data at a retail or hospitality company is useful for identifying the "what" and "where" of a customer purchase, but that data does not tell the whole story. Combining external market data, such as consumer sentiment, that explains "why" a customer made a particular purchase, along with geospatial data, to identify where a potential customer may be open to messaging and communication, helps build a precise picture of customer opportunity. Data science can make those connections — painting a more detailed and accurate picture of a target's growth prospects within the broader dynamics of its market.

Enhanced customer retention: A broad, stable, and loyal customer base contributes to the attractiveness of a potential target. A primary goal for PE firms post acquisition is often to improve customer retention. Using data science during the pre deal phase, firms can determine the expected odds of successfully retaining a target's customer base by assessing a range of indicators, such as cross-channel sales, repeat customers, customer service tickets, and social media sentiment. These insights can alter the valuation and bid price — and potentially allow the PE firm to win a competitive bid based on better customer retention models.

Sales pipeline management: With access to a target's existing sales system, PE firms can use data science to assess the risks and opportunities in the current sales pipeline–and identify patterns of successful sales representative activity over time. When combining information from the sales system with external data sets such as geospatial proximity data, economic trends, and marketing activity, PE firms can identify potential unseen opportunities or threats that can be incorporated into their valuation. These insights are simply not available through traditional data analysis processes.

Example: Justifying a winning bid by identifying white space growth opportunities pre deal

Challenge — A PE firm was considering the acquisition of a national QSR chain in the US. The PE firm believed the target company had strong fundamentals (e.g., consumer sentiment, growing market share, and profitable growth), which could be used to expand its national footprint and existing footprint white space. This was key to its investment value creation thesis.

Actions — Deployed an advanced M&A analytics platform to ingest 500 GB of data to analyze and reconcile store-level P&Ls within 24 hours.

— Data scientists blended internal data with external alternative data and developed regression and predictive models to understand profitability of existing and planned locations based on customer demographics, population concentration, store hours, and other factors.

— A natural language processing application was used to gather 20 million social media mentions related to the target and its competitors in order to conduct in-depth customer sentiment analysis based on period and location.

Result — PE firm won a competitive auction with a bid supported by tangible and immediate growth opportunities identified during a rapid assessment conducted over a 72-hour period. The review of expansion activities highlighted potential locations with limited expected profitability, allowing management to redirect expansion to more profitable locations. A series of additional priority markets was also identified based on revenue potential and location characteristics (e.g., customer demographics and buying preferences). In the end, the analysis helped validate the potential white space growth prospects, which helped justify the valuation of the winning bid.

Projecting potential performance improvements

Uncovering opportunities to improve and sustain performance for the target can increase the valuation and lead to a winning bid.

— How do we align the operating model to better serve our business model?

— What processes could be adjusted to drive better efficiencies and reduce costs?

— How does the target's technology infrastructure, operating model, and other factors compare to industry standards, and how can they be improved?

Data science is critical in helping PE firms identify opportunities to improve operational performance within a target company and the potential value associated with performance improvements across a broad variety of metrics. Analysis can be done quickly across a wide range of potential operational metrics.

Performance opportunities

Supply chain

— Procurement optimization
— Effective inventory management
— Freight optimization
— Supply chain efficiencies
— Warehouse optimization

Operations

— G&A optimization
— Cost avoidance & take out
— Technology operations enablement
— Fulfillment and customer acquisition cost
— R&D portfolio allocation

People

— Organizational headcount analysis
— Labor productivity and automation
— Call center optimization

Examples of operational levers in action

SKU rationalization: In the past, companies would often look at their "least profitable" or "negative profitable" SKUs as targets for elimination. However, data science offers a more refined way to develop rationalization models. Basic performance analysis can be augmented with halo and cannibalization effects, linear optimization, and forecasting to understand how products interact with each other and what the "real" effect on profitability is when adding to or removing from a portfolio. Sometimes customers who buy multiple SKUs with a company will stay with that company and buy a substitute SKU if one is removed. Other times, they will leave the company entirely. Understanding the difference is paramount, and data science can help.

Warehouse optimization: Another lever that companies can pull to reduce cost is through the consolidation and optimization of assets such as warehouses. Warehouse optimization allows for realignment of the number of warehouses with capacities while covering the demanding locations within a maximum given distance. Here, advanced analytics, in the form of footprint and sensitivity analytics, is used to identify which warehouses are operating sub optimally and need to be moved, possible places for relocation, and the net effect of that movement. This enables companies to reduce costs and, at the same time, improve the efficiency of their operations.

Example: Identifying performance improvement opportunities through data science to win a competitive bid

Challenge — A PE firm was seeking to acquire a restaurant franchisee with 1,100 units in the US. The valuation thesis required improving store performance through a more efficient delivery business. To support the valuation, the PE firm needed to diagnose the underlying drivers of a four wall revenue and cost—and identify potential improvement opportunities.

Actions — By combining internal data sets such as monthly P&L with external data sets including regional demographic, competitor benchmarks, geospatial data and more, machine learning models were developed to identify characteristics correlated with strong financial performance.

— Using these insights, the PE firm was able to identify the optimal levers that would improve store performance.

Result — At deal speed, the firm was able to develop a plan to improve EBITDA by US$30– US$40 million per year through specific levers of performance improvement. The firm also found opportunities to reduce area manager count by one-third while keeping travel times consistent. The analysis validated the deal hypothesis and led to a successful bid in a competitive context.

Realizing value within portfolio companies

Once a deal has closed, PE firms are challenged to take steps to quickly increase asset value. Data science can play an important role in driving performance improvements within an acquired company or across a PE firm's investment portfolio over time. PE firms can use data science to establish, measure, and monitor relevant, specific, and meaningful KPIs consistently over time so they can more readily assess and enhance their asset valuations. Doing this successfully can drive enhanced revenue and an improved cost structure.

Revenue enhancement

Once a deal is completed, data science should play an essential role post deal in helping PE firms enhance revenue associated with an acquired company or across their portfolio. Using machine learning, models can be built and refined for improved market strategies.

Example of revenue lever in action

Marketing and sales investment: Using data science and advanced analytical methods to quantify ROI is not a new concept. These methods have long been used by conventional enterprises, whose timelines are longer for conducting such analyses. However, with today's technology and tools, PE firms now have the ability to conduct similar analyses in much shorter timeframes. Analysis of elements such as price elasticity, marketing mix/effectiveness, and sales decomposition can quickly answer questions about growth and profitability with more precision and certainty.

Example: Improving revenue via data science through an optimized pricing and upgrade strategy

Challenge — A PE firm wanted to assess the pricing and upgrade strategy of a hotel chain within its portfolio. The company, with a series of locations in Europe, provided a limited number of hotel room format offerings. One higher-end room format had flat sales over the previous 18-month period, and the PE firm wanted to understand how it could both sell more higher-end rooms and realize a higher price premium for higher-end rooms over standard rooms.

Actions — Compiled diverse sources of information, such as CRM booking data, internal guest survey data, and external market research data

— Conducted specialized analytics using the mix of internal and external data, including customer segmentation using statistical clustering to calculate core customers, calculation of total revenue lift by increasing daily rates for specific customer segments, ranking of desired higher-end room benefits based on importance and feasibility, and identification of priority locations to achieve the quickest return

Result — The data science-driven analysis allowed the company to fully understand the nuances in its customer base and target the right customers to optimize revenue through its pricing and upgrade strategy.

Cost optimization

In order to enhance the valuation of an acquired company or across companies within their portfolio, many PE firms focus significantly on cost optimization. Data science can play a critical role in helping PE firms understand opportunities to optimize costs and improve efficiencies.

Example of cost lever in action

Supply chain management: Using data science, PE firms can better manage the growing complexities associated with supply chain management, such as real-time inventories. Driver-based forecasting, using simulation and optimization algorithms can effectively capture shifting customer preferences and likely shifts in customer demand so management can make adjustments more rapidly, identify exceptions, and divert products in real-time, if necessary. This can, in turn, reduce inventory costs, increase efficiency, and generate other tangible benefits.

Example: Driving better pipeline performance in a portfolio company through data science

Challenge — A PE firm needed to improve cash flow, working capital, and revenue forecasts for a carve-out manufacturing business. Delivery of order backlog was often delayed with little advance warning to management. At the same time, the sales force was undisciplined in pipeline management, leading to unpredictability in the amount of incoming orders.

Actions — Using data science and analytics, the PE firm assessed backlog delivery, using product-level trends, to identify drivers of past-due backlog and areas of risk in the company's manufacturing and planning process.

— Data science was applied to the historical pipeline trends and external data to build a machine learning engine that predicts pipeline results.

Result —The firm established clear action steps to achieve a more capital-efficient and operationally effective company, enabling a reduction of at least US$25 million in net working capital. Management was also able to identify the drivers of won/lost/delayed sales opportunities — leading to a 30 percent improvement in forecast for new orders.

Integrating data science: "Build versus buy"

While many PE firms recognize they need to leverage data better, few understand what they need to do in order to implement a data science approach to support their investments. A fully integrated data science approach will include the right combination of people, processes, technology and tools, and data sources. The question to consider is whether it makes the most sense to build these capabilities in-house or to partner with an external firm that specializes in applying data science.

Decision-making criteria

Making a decision to build or buy data science capabilities is an important strategic direction that requires careful consideration. In thinking about the right approach, these criteria should be taken into account.

	Low	High
Business complexity	Build	Buy
Current capabilities	Buy	Build
Willingness to invest	Buy	Build

Business complexity

Complexity is a leading determinant of whether a company can successfully scale up an in-house data science capability. Evaluate the number of portfolio companies, industry concentration, annual deal volume, and other factors. In the face of high complexity, companies should consider partnering with an external firm.

Current capabilities

PE firms need to evaluate the size of the "gap" between their desired end-state and their existing talent and tools. Moving from an existing in-house advanced analytics capability to data science and machine learning is a smaller gap than starting from scratch. Evaluate the percentage of deals using D&A to inform decisions, people, processes and existing tools and technology.

Willingness to invest

A data science capability requires a wide range of tools, resources, time, and investment. A PE firm needs to evaluate their willingness to invest in enterprise-level solutions and continuously invest to keep up-to-date on skills, tools, and data. Evaluate the percentage of revenue that the PE firm is willing to commit to growing the capability, and the strategic relevance of data science moving forward.

Bottom line

If a PE firm evaluates its business strategy as "Build" across all three criteria, then developing a full in-house data science capability is a feasible option to consider. If the firm evaluates their business as "Buy" across any of these, then partnering with an experienced data science team ("buy") is the recommended approach.

Taking the next steps

Once a decision has been made to partner with an outside firm or to build a full in-house capability, PE firms should quickly take the necessary steps to integrate data science into their processes.

Build	VS	Buy

A fully integrated data science approach will include the right combination of people, processes, technology and tools, and data sources.

People

PE firms need to develop an organizational structure and hire personnel with an analytical mind-set who can diagnose the drivers of performance, make data-driven recommendations, and institutionalize a data science way of thinking. When recruiting data scientists, PE firms should focus on individuals with experience in business processes that apply advanced data modeling to a PE context. This will often require a significant learning curve and substantial training.

Processes

PE firms need to develop processes to enable the appropriate and consistent application of data science to decision making in both pre- and post deal contexts. When considering process changes, PE firms need to look at not only direct processes but also processes that support the collection of data, results dissemination, and deal decision making.

Technology and tools

PE firms need to understand and implement the innovative tools and solutions (e.g., machine learning, AI, and RPA) that can be used to support data science and how these tools could align with organizational growth objectives. This helps ensure that relevant investments are well positioned to contribute to long-term results.

Data sources

PE firms need to identify and gain access to specific data sources that would feed into their data science activities and make the investments required to access those data sources. Without access to relevant external data, PE firms will not be able to take full advantage of their data science activities.

PE firms should look for a partner that can provide comprehensive support across the PE lifecycle. Consider these factors when making a decision:

PE industry expertise

The data science partner must have in-depth experience and knowledge of the PE market, the industries of portfolio companies, and the dynamics of deal-making in a PE context.

Capabilities

The partner needs to have a seasoned staff of business-focused data sciences that translate complex data outputs into business guidance in deal speed. Having data scientists on staff is not sufficient. They need to have a track record of relevant, effective implementation for PE.

Data sets

Data science partners will have access to both proprietary data as well as subscriptions to a range of external data sources. These external subscriptions can often be quite costly, and thus a valuable asset that a data science partner can offer a PE firm. When choosing a partner firm, be sure to inquire of proprietary and externa data sets, and determine how relevant they are for your business context.

Platforms

Quickly compiling, hosting, analyzing, and exporting insights from massive data sources requires the right platforms. The right data science partner should utilize industry-leading technology that allows them to quickly manage the process.

Taking these areas into consideration helps ensure that the PE firm has a single, reliable source for complex data science across the deal lifecycle.

Conclusion: Build competitive advantage through data science

With both the availability of data sources and the sheer volume of data increasing, PE firms need to find more advanced ways to assess massive amounts of variable data quickly and with confidence so that they can make better deal decisions.
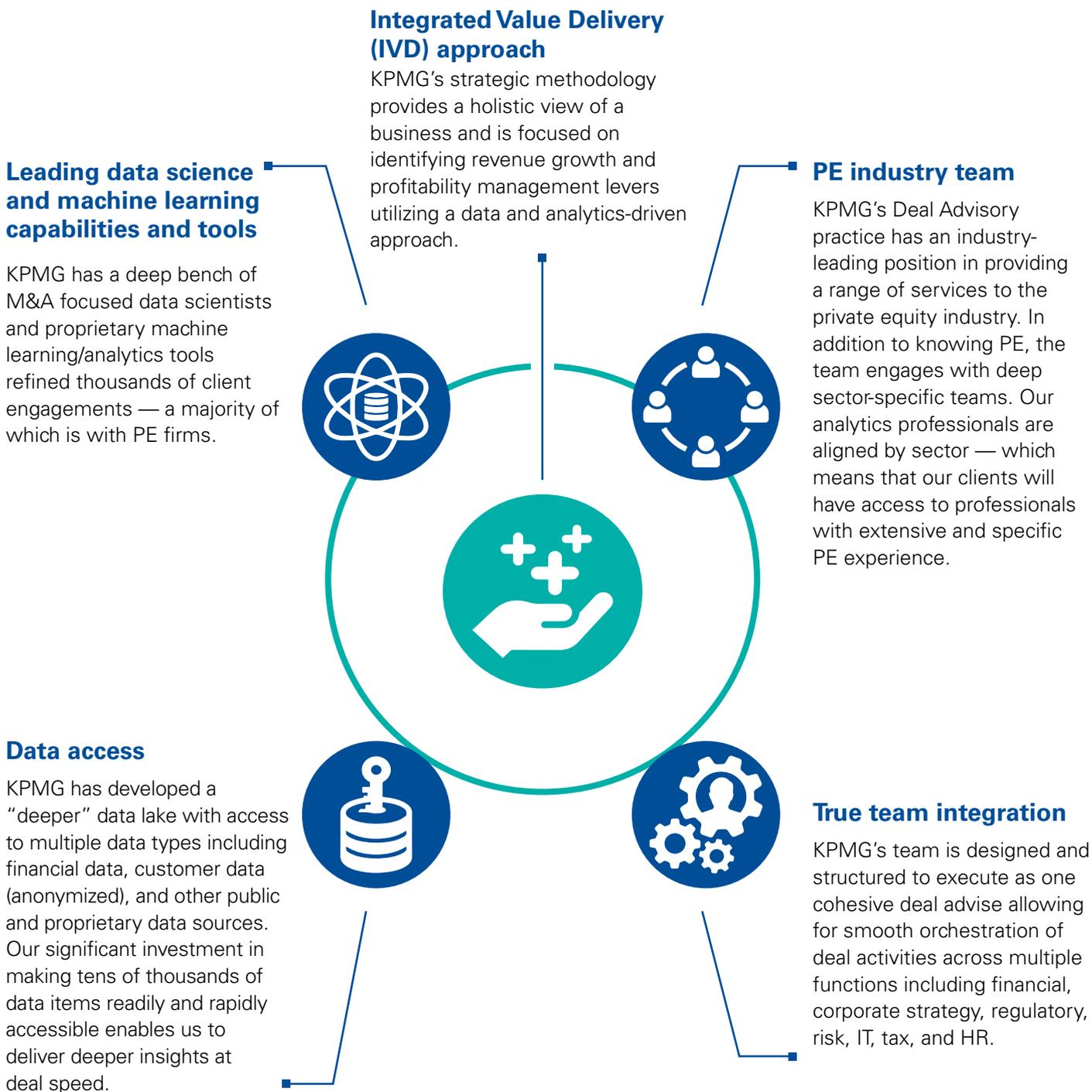
By leveraging data science effectively, PE firms can gain a significant competitive advantage — one they can harness to better identify and assess high-opportunity targets, conduct stronger pre deal due diligence, and capitalize on post deal transformation opportunities.

As the importance of data continues to increase, PE firms willing to embrace data science will be well positioned to achieve their desired deal outcomes. Organizations that cling to the status quo, meanwhile, may quickly find themselves at an information disadvantage, which may erode their competitiveness over the long term.

How KPMG can help

KPMG has cracked the code on extracting insights and value for PE firms through data. Making this work requires the right mix of technical expertise, industry alignment, tools, data sources, and business experience. KPMG has built, tested, and refined our analytics methodology and capabilities across thousands of client projects. Our professionals have delivered significant insights and impact for PE firms in both the pre- and post deal contexts.

Integrated Value Delivery (IVD) approach

KPMG's strategic methodology provides a holistic view of a business and is focused on identifying revenue growth and profitability management levers utilizing a data and analytics-driven approach.

Leading data science and machine learning capabilities and tools

KPMG has a deep bench of M&A focused data scientists and proprietary machine learning/analytics tools refined thousands of client engagements — a majority of which is with PE firms.

PE industry team

KPMG's Deal Advisory practice has an industry-leading position in providing a range of services to the private equity industry. In addition to knowing PE, the team engages with deep sector-specific teams. Our analytics professionals are aligned by sector — which means that our clients will have access to professionals with extensive and specific PE experience.

Data access

KPMG has developed a "deeper" data lake with access to multiple data types including financial data, customer data (anonymized), and other public and proprietary data sources. Our significant investment in making tens of thousands of data items readily and rapidly accessible enables us to deliver deeper insights at deal speed.

True team integration

KPMG's team is designed and structured to execute as one cohesive deal advise allowing for smooth orchestration of deal activities across multiple functions including financial, corporate strategy, regulatory, risk, IT, tax, and HR.

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