Benchmark Insights

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AI-assisted acquisitions

A new analytics-driven M&A landscape for chemicals and petroleum companies

IBM **Institute for Business Value**

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How IBM can help

The IBM chemicals and petroleum industry team designs and implements solutions for chemicals as well as oil and gas companies. We help these companies turn information into insights that enhance exploration and production, refining and manufacturing efficiency, global trading, risk management, and operations in real time. IBM offers end-to-end industry solutions, including integration and collaborative platforms, hardware for supercomputing, software to optimize operations, and business and IT consulting. For information about IBM chemicals and petroleum solutions, visit ibm.com/industries/chemicals or ibm.com/industries/oil-gas.

By Paul Price, David M. Womack, Lisa Fisher, and Spencer Lin

Key takeways

Our research identified a group of chemicals and petroleum merger and acquisitions (M&A) leaders that achieve higher performance gains using digitized, modern M&A capabilities.
Leaders' M&A capabilities are characterized by centralized governance, workflow, automation, and use of analytics and AI.

M&A leaders apply analytics and AI across the M&A lifecycle.
Applications help them identify opportunities/targets and quantify value, understand and mitigate value at risk, and realize and optimize deal value.

A conceptual, domain-specific architecture sets the foundation for implementation of modern M&A capabilities.
M&A is complex and requires commitment from diverse stakeholders. A conceptual architecture composed of a data layer and an insights layer—where analytics and AI are leveraged—sets the foundation for dialogue.

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The M&A route to reinvention

The chemicals and petroleum industry has long used M&A as a critical strategy. When examining the history of M&A deals across industries, chemicals and petroleum represents 20 percent of the 50 largest deals of all time (see Figure 1).

Pre-pandemic M&A transactions reflect how chemicals and petroleum companies were responding to the disruptive global environment prior to COVID-19. Using AI-enabled M&A strategies to address today's disruptions of global political and economic uncertainty—decreased demand for oil, lower levels of investment, and accelerating energy transition—can help these organizations re-establish progress.

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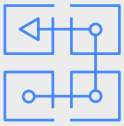
Figure 1
Chemicals and petroleum represents a fifth of the largest 50 M&A deals in history

Rank	Year	Purchaser	Purchase	Transaction value (USD billions)
7	2015	Dow Chemical	DuPont	130
11	2018	ChemChina	Sinochem	120
17	2016	Praxair	Linde AG	85
19	1998	Exxon	Mobil	77
21	2004	Royal Dutch Petroleum	Shell Transport & Trading Co.	75
28	2015	Royal Dutch Shell	BG Group	70
30	2019	Saudi Aramco	SABIC	69
40	2016	Bayer	Monsanto	55
42	1998	BP	Amoco	53
48	2016	ChemChina	Syngenta	43

Source: IBM Institute for Business Value analysis.



91%

of chemicals and petroleum M&A leaders have higher levels of M&A workflow automation—potentially leading to **79 percent** fewer M&A full-time equivalents (FTEs) than their industry peers.

2% **increase**

Chemicals and petroleum M&A leaders increased their gross margin from **18% pre-merger** to **20% post-merger**.

89%

of chemicals and petroleum M&A leaders apply advanced analytics and AI to enable faster decision-making on M&A deal go/no-go decisions.

To better understand strategies behind M&A success, the IBM Institute for Business Value (IBV), in cooperation with Oxford Economics, surveyed leaders from 720 organizations across the chemicals and petroleum, electronics, healthcare, and life sciences industries. Respondents represented 18 countries and included 220 chemicals and petroleum executives. Each respondent holds overall responsibility for the M&A process, from the definition of M&A strategy to post-purchase integration (see "Study approach and methodology," page 19). Executives were asked about the productivity of their M&A processes, the application of advanced analytics and AI throughout the M&A lifecycle, and the performance of their M&A deals.

Why chemicals and petroleum companies buy

In 2019, chemicals and petroleum deals were valued at over USD 550 billion.[1] Companies buy for the same reasons as organizations in other industries: to expand scope or scale (see Figure 2). The Bayer/Monsanto deal is an example of scope expansion around crop sciences, while Saudi Aramco's acquisition of SABIC was scale driven to expand downstream operations in refining and petrochemicals.[2] But beyond these basic reasons, most companies have a more nuanced and layered set of buying criteria. In fact, surveyed responses yield more than 40 unique combinations of reasons behind their M&A pursuits.

Each segment within the industry pursues different strategies in its M&A:

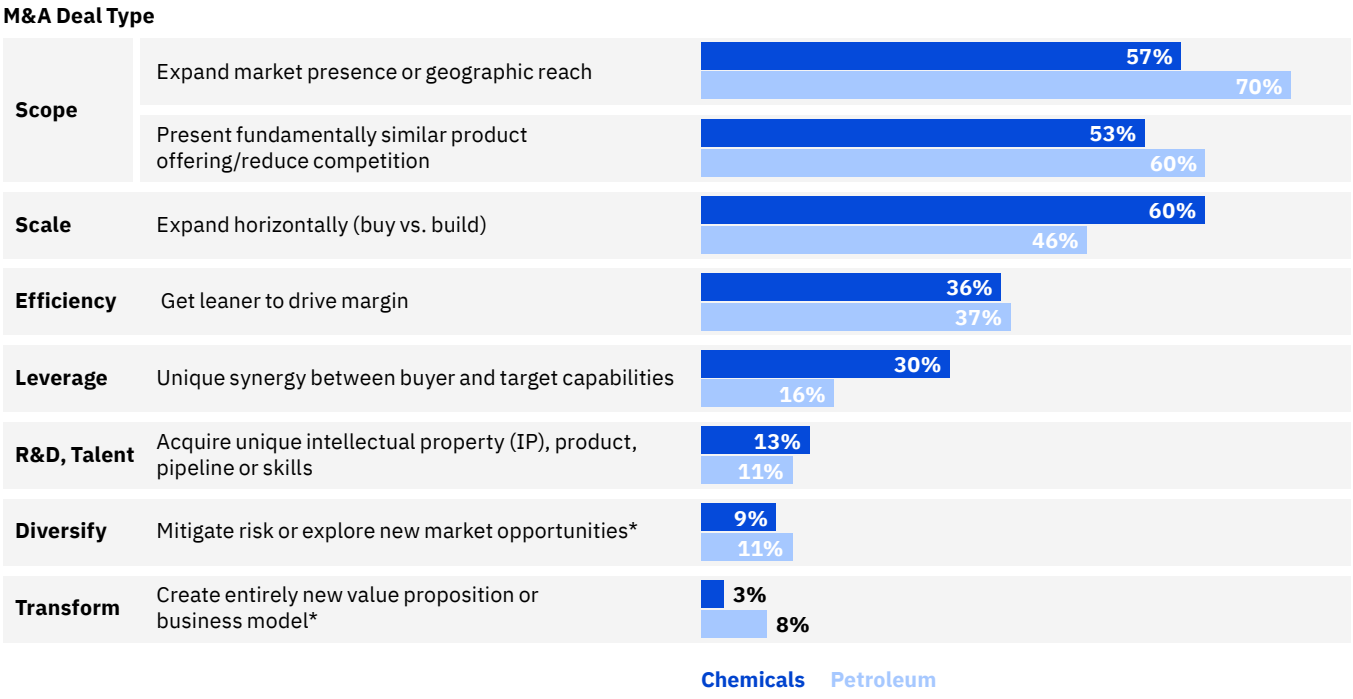
In chemicals, the merger of Praxair/Linde AG created the world's largest industrial gas company.[3] Synergies were driven by scale benefits, cost savings, and efficiency improvements.[4]

In upstream oil and gas, efficiency and scope have driven recent transactions. For example, Occidental Petroleum's acquisition of Anadarko created a combined company that is the largest player in the Permian Basin and one of the top producers in the Gulf of Mexico.[5] The deal is expected to generate USD 3.5 billion per year in cost savings and capital spending cuts and allows Occidental to apply its Permian Basin expertise to Anadarko's Texas and Colorado oil fields.[6]

50 weeks: The median time to execute the M&A process, from strategy to integration.

Figure 2

Why chemicals and petroleum companies buy



**Results using low counts are statistically unreliable but can be considered directional.*
Survey question: What are the primary objectives of your organization's M&A activity?

BP bought BHP Billiton's US shale oil and gas assets for USD 10.5 billion to increase its US onshore oil and gas resources by 57 percent.[7] Investment in deep-water assets, such as ExxonMobil in the Guyana-Suriname Basin in South America and Shell in Brazil, suggests these companies are positioning their portfolios to protect themselves from price volatility.[8]

In midstream oil and gas, scale is the rationale behind the Energy Transfer Partners USD 60 billion merger with Energy Transfer Equity.[9] The combined entity created a more simplified ownership structure, improved its overall cost of capital, and allowed Newco to continue pursuing growth capital projects and strategic merger and acquisition transactions.[10]

In downstream oil and gas, scale through better integration across the value chain drove Marathon Petroleum's acquisition of Andeavor for USD 35.6 billion. The merger linked Andeavor's gathering and transportation infrastructure in West Texas to Marathon's United States Gulf Coast refinery to provide access to low-cost crude oil supply.[11]

Each of these M&A deals is complex, time-consuming, and inherently risky. Our survey respondents indicated that it takes 50 weeks (median) to execute the M&A process from strategy to integration. After integration, the merged companies take an additional 80 weeks (median) to achieve about 60 percent of projected synergies. And it took 85 weeks post integration for respondents to realize a profit.

M&A leaders realize an 11 percent increase in gross margin between pre- and post-merger.

Modernizing M&A

It's mission critical for buyers and sellers to know if their organizations can blend successfully. Until two companies move beyond "dating" to merging, "mismatches" are a risk. How can they be more successful in managing their M&A activity and enhancing overall performance?

To help answer this question, we analyzed survey responses and identified a small group of "leaders,"—consisting of 29 percent of surveyed chemicals and petroleum companies—that are achieving better outcomes from their M&A activity. These companies have a modern M&A foundation— M&A workflow with process and governance models—augmented with automation, analytics, and AI.

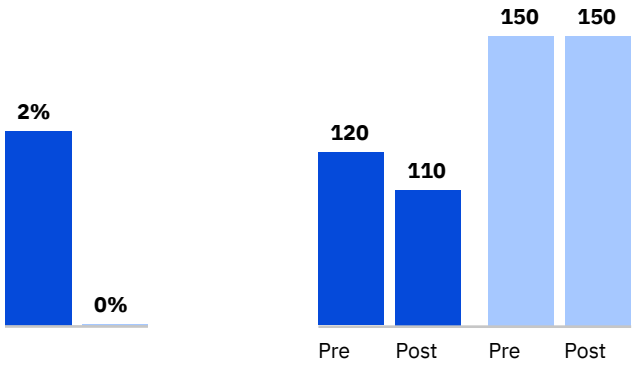
They have M&A process metrics and targets defined. Performance is measured, reported, and analyzed. M&A roles are defined, and core M&A resources provide support to functions and lines of business. This M&A governance and execution approach, in conjunction with workflow and organizational processes, drive corporate development models for modern M&A. Automation, analytics, and AI are critical to scoping and scaling the process. They help to repeat prior successes, reduce friction, and elevate a company's portfolio above any one transaction. The combination of these capabilities makes the leaders' M&A activities repeatable and scalable across multiple transactions.

Chemicals and petroleum M&A leaders perform better and operate differently

M&A leaders have realized greater quantitative and operational benefits from their M&A activity (see Figure 3). When comparing pre-merger and post-merger performance on key metrics, their M&A activity has delivered, on average, a 2 percent increase in gross margin and a ten day reduction in time to market for new products and services—compared with no change for all other chemicals and petroleum companies on both metrics.

Figure 3

M&A leaders: average pre-merger vs post-merger performance on key metrics



Gross margin (%) difference. Pre-merger (acquirer) vs post merger (newco)

Time to market (in days) for new products and services. Pre-merger (acquirer) vs post merger (newco)

M&A leaders All others

Survey question: How does your organization typically perform on the following metrics pre- vs. post-merger?

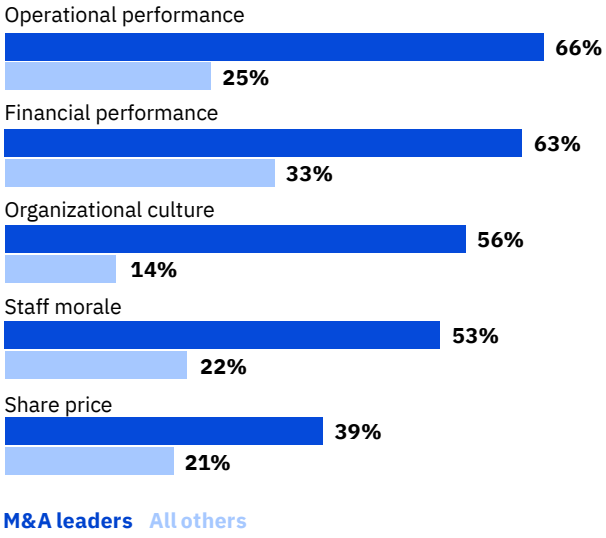
M&A leaders are driving effective, inorganic portfolio growth. In other words, they are better at directing their M&A functions toward achieving their organizations' corporate development objectives.

When acquiring unique IP, product, pipeline, or skills, M&A leaders increased their total market share from 20 percent pre-merger to 29 percent post-merger, compared with no change for their peers. M&A leaders who expanded horizontally reduced their time to market by 13 percent—from 150 days to 130 days–compared with no reduction for other companies. Acquisitions to mitigate risk or explore new market opportunities added seven points to leaders' total market share, compared to just two points for other companies.

Leaders are more likely to say their M&A activity has had a positive impact on all aspects of their organizations' performance (see Figure 4). They also perform better financially; eight times more companies in this group outperform in profitability compared to others (see Figure 5).

Figure 4

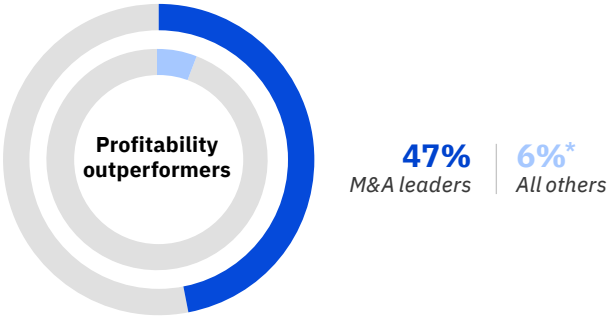
The positive impact of M&A activity on performance



Survey question: What impact has your organization's M&A activity had on each of the following?

Figure 5

Percentage of profitability outperformers in each group



** Results using low counts are statistically unreliable but can be considered directional. Survey question: How does your organization's profitability compare with that of your industry peers over the past 3 years?*

In addition to more mature organizational capabilities, critical differences in three aspects of leaders' M&A operations account for their outperformance:

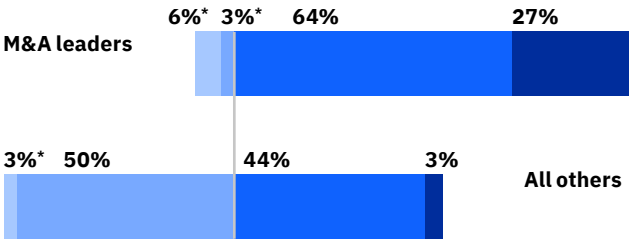
1. M&A governance and execution model
2. M&A workflow and process automation
3. Use of analytics and AI across the M&A lifecycle.

M&A governance and execution model

Most M&A leaders use a centralized governance model. Dedicated corporate development M&A groups drive process and strategy across business units (see Figure 6). This helps create more of a portfolio-based approach. Almost 50 percent of other companies have M&A practitioners that define the M&A strategy and conduct all pre-deal activity located in each business unit (BU). While this decentralized model may be beneficial for a specific BU, it results in a transactional focus and may not factor holistic benefits for the enterprise into the business case. In addition, it limits the ability to share and repeat learnings from past successes across BUs.

Figure 6

M&A governance and execution model



External - External resources perform M&A activities on ad hoc basis

Decentralized - M&A Group at Corporate level drives M&A process and strategy across BUs

Centralized - M&A practitioners located in each business unit (BU)

Hybrid - Corporate and BUs share responsibility for defining M&A strategy, resources, and activities

** Results using low counts are statistically unreliable but can be considered directional. Survey question: Which of the following models best describes how your organization governs and executes M&A activities/projects?*

Insight: How M&A leaders resource their initiatives

M&A leaders tap external resources at select times during the lifecycle to perform M&A activities. A third obtain expertise from senior advisors in screening activities, compared to just 13 percent of their peers. Over two thirds of leaders combine external resources with internal staff to drive negotiations, versus 54 percent of peers. Nearly a quarter of the leaders use external resources to execute key tasks during due diligence.

More than a third of M&A leaders' integration teams start planning as early as the strategy and screening processes, compared to just 7 percent of their peers. Thirty-eight percent start performing cybersecurity assessments—to investigate and identify cybersecurity and data privacy risks and liabilities posed by M&A transactions—prior to due diligence, compared with only 13 percent of others.

M&A workflow and process automation

More than 70 percent of M&A leaders have automated major M&A process steps such as due diligence and integration. Almost a fifth have gone even further and use standard tools across the full M&A lifecycle. Most other companies have limited or no automation, relying on well-vetted spreadsheets and manual materials (see Figure 7). They have yet to "bake" their experience and expertise into tools that make the M&A process faster and scalable. High levels of automation could explain why leaders' M&A operations are less resource intensive—9 M&A FTEs per billion in revenue versus 42 M&A FTEs per billion in revenue for all others.

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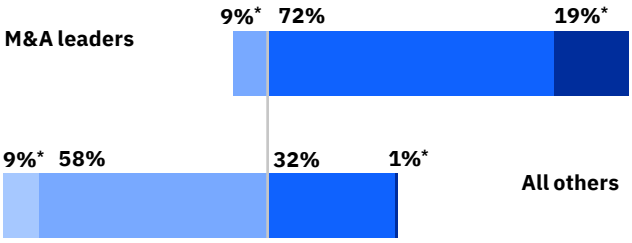
Figure 7

Automation of the M&A process



- No automation (spreadsheets used to manage the process)
- Limited automation (inconsistent tools used in major process steps, such as due diligence and integration)
- Moderate automation (standard tools used in the major process steps, such as due diligence and integration)
- Significant automation (standard tools used across the full M&A lifecycle)

** Results using low counts are statistically unreliable but can be considered directional. Survey question: To what extent have you automated the M&A process?*

More than 70 percent of M&A leaders have automated due diligence and integration processes.

Analytics and AI across the M&A lifecycle

Where chemicals and petroleum M&A leaders truly stand out is in the use of analytics and AI across the M&A lifecycle, which they do to a far greater extent than other companies (see Figure 8). This translates to an ability to scale to manage multiple transactions simultaneously.

As demonstrated by M&A leaders, operational nuances affect the extent of the benefits companies derive from M&A strategies. These differences are what define modern M&A. They increase the scope and scale of dedicated M&A capabilities across the entire M&A lifecycle. They allow companies to evaluate unlimited opportunities in target screening, instead of only a handful. They make it possible to scrutinize virtually all relevant data and contracts in due diligence, not just a sample. And they support the build of detailed integration plans that are execution-ready on day one.

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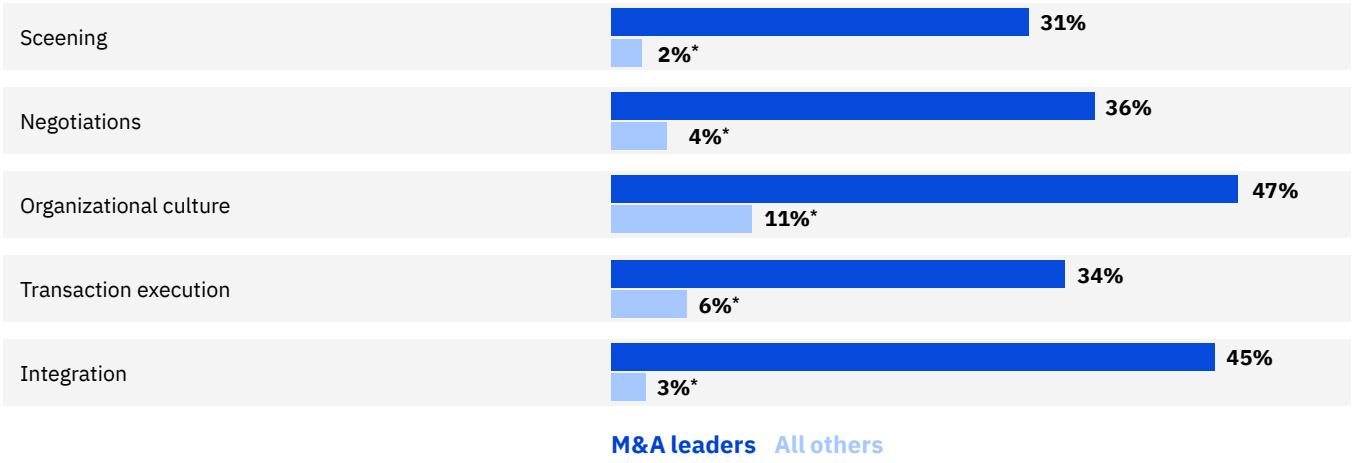
Figure 8

Analytics and AI applied to a significant extent



** Results using low counts are statistically unreliable but can be considered directional.*
Survey question: To what extent are you applying AI in each step of the M&A process?

Chemicals and petroleum M&A leaders are applying analytics and AI to quantify opportunities at nearly twice the rate of their peers.

M&A analytics and AI applications

We asked respondents how they apply analytics and AI throughout the M&A lifecycle. M&A leaders are ahead in using them for specific applications. These applications can be embedded to accelerate and expand the scope of key activities in three phases of the M&A lifecycle: identify and quantify value, understand and mitigate value at risk, realize and optimize deal value (see Figure 9).

Identify and quantify value

When supported by analytics and AI, companies can consider a broader set of potential acquisitions during the strategy and screening processes. They also support identification, investigation, and management of value-creation opportunities with greater speed and precision, spanning multiple potential transactions simultaneously.

1. *Scan for value*

More chemicals and petroleum M&A leaders are tapping analytics and AI to pinpoint opportunities (see Figure 10).

Identify M&A transaction opportunities and potential acquisition targets that match requirements prioritized in the M&A strategy. Natural language processing (NLP), information discovery, and categorization services can be used to evaluate business news and companies' public remarks, such as earnings calls. Then, sentiment analysis (such as word usage and speech patterns) can yield, in real time, a set of companies that align with M&A strategy guidelines and potential targets.

Identify value creation opportunities. Analytics and AI applications can highlight similar transactions for analysis and extract real-time earnings before interest, taxes, depreciation, and amortization (EBITDA)—as well as public share price data—to create a live database of EBITDA multiples. To support discounted cash flow (DCF) valuations, tools can gather information on discount factors and risks to a company's cash flows. Automated scanning tools can also evaluate multiple potential scenarios or value sources for each target, identify value-creation opportunities, and predict realized value.

Figure 9

Applying analytics and AI to modernize M&A

Source: IBM Institute for Business Value analysis, 2020.

Figure 10

Application of analytics and AI to scan for value

Survey question: How are you applying AI in the strategy and screening steps?

2. *Quantify potential value*

More chemicals and petroleum M&A leaders are applying analytics and AI to quantify opportunities (see Figure 11). In fact, nearly double are using these technologies to determine transactions that offer the best returns.

Identify M&A transactions offering better return on investment (ROI) or risk-adjusted returns. AI-assisted search can help develop comparables across markets, sectors, or countries and pinpoint opportunities that offer a better ROI. These values can then be used to drive calculations of risk-adjusted returns and derive a fair valuation of each target.

Understand factors that impact the business models of potential targets. Analytics and AI can be used to perform a deep dive into the target's IP, litigation, investigations, trading partners, or executive team. Predictive modeling can then be applied to determine the possible impact on value. The scope of traditional modelling can be expanded to include macroeconomic data, demographic data, and competitor information. This paints a multidimensional view of targets and potential reactions to business and economic conditions with far greater efficiency and reach than human intelligence alone.

Understand and mitigate value at risk

Once the most promising target has been identified, exhaustive due diligence can be conducted. Analytics and AI support two activities that identify, understand, and assess all types of risk. These outputs inform critical decisions.

For the negotiating team, better risk assessments help determine if a target's value is truly aligned with the acquirer's needs. These assessments steer pricing guidelines, deal terms, and structure. Seamlessly incorporating findings from multiple internal and external sources into living business case documents—automatically

Figure 11

Application of analytics and AI to quantify potential value

** Results using low counts are statistically unreliable but can be considered directional.*
Survey question: How are you applying AI in the strategy and screening steps?

Chemicals and petroleum M&A leaders use analytics and AI to assess deal risks 81 percent more often than their peers.

updated by multiple relevant participants throughout the M&A cycle—can stress-test investment hypotheses. This supports and appropriately challenges identification of near-term synergies, pre-merger integration, and execution plans to refine them accordingly. Over a quarter of chemicals respondents and more than four-in-ten petroleum respondents told us their greatest M&A challenge is the absence of a detailed business case defined during evaluation and updated throughout the M&A process. The solution is a living business case, which reflects changes based on what is discovered over time.

1. *Identify risks*

More chemicals and petroleum M&A leaders are using analytics and AI to assess all types of deal risks (see Figure 12).

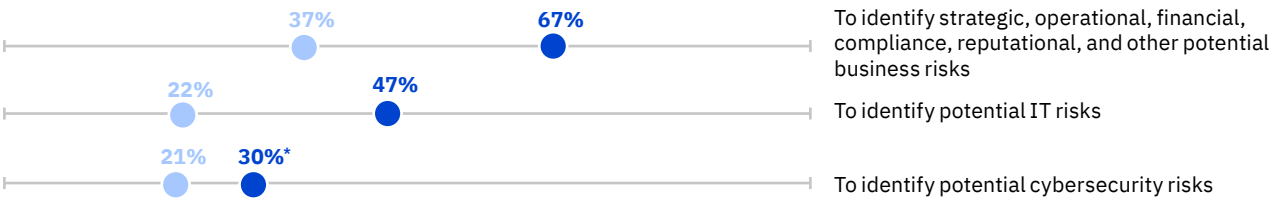
Identify strategic, operational, financial, compliance, reputational, and other potential business risks. The acquirer typically assumes the assets and liabilities of the target. Unforeseen environmental liabilities, management liabilities, political risks, and fiduciary and benefits liabilities can all endanger an M&A transaction. To help prevent unanticipated financial exposures and possible losses, technology can increase an acquirer's ability to assess target liabilities in depth and at speed. Machine learning algorithms can generate risk assessments based on historical or analogous deal and risk data. This can highlight integration risks that can be evaluated by those executives and subject-matter experts with specific domain knowledge.

Identify potential IT risks. Procedures and protocols for protection of all information at the target, potential GDPR issues, and other compliance-driven risks need to be assessed. Once detailed information on access points or potential attack surfaces from across the target are gathered, analytics can be used to coordinate, report, and align them with requirements for compliance evaluation.

Identify potential cybersecurity risks. More than one-in-five surveyed chemicals and petroleum companies have experienced data breaches that can be attributed to their M&A activity during integration. One-in-ten experienced such breaches post-integration. Data breaches, particularly public ones, carry potential liabilities. Additionally, lawsuits and noncompliance implications can negate the acquired company's value. These exposures must be accounted for in deal valuation. As part of a detailed M&A cybersecurity assessment, advanced behavioral analytics can be applied for breach detection. Vulnerabilities that exist in the target's information systems need to be identified. Proactive assessment and monitoring of the networks, applications, and other systems should be conducted on both the acquirer's and the seller's sides.

Figure 12

Application of analytics and AI to identify risks



** Results using low counts are statistically unreliable but can be considered directional.*
Survey question: How are you applying AI in the negotiation step?

2. *Mitigate risks*

Eighty-nine percent of chemicals and petroleum M&A leaders are tapping analytics and AI to make go/no-go decisions, compared to just 52 percent of all others.

Enable faster decisions. Technology-enabled, in-depth assessment of target liabilities allows the acquirer to account for all potential exposures in the price. A comparison of those exposures with expected returns in the living business case determines whether the price is appropriate. If the risks associated with achieving potential value are deemed manageable, due diligence can continue in earnest. If not, analytics and AI can help determine the next move quickly—either negotiation of a new price or walking away from the deal.

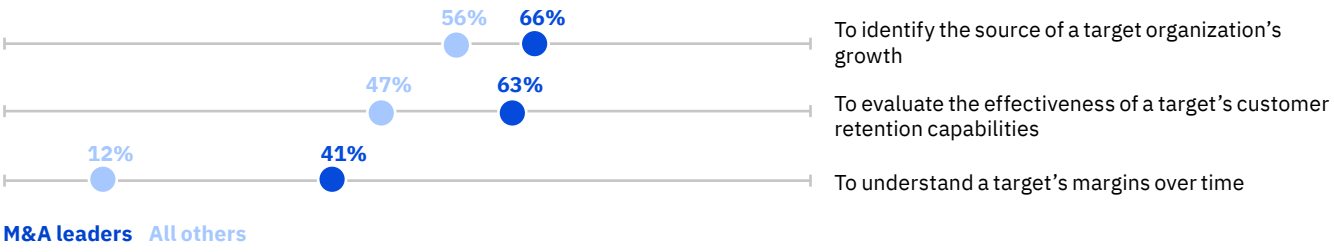
3. *Analyze margins*

More chemicals and petroleum M&A leaders are using analytics and AI to assess margins (see Figure 13).

Identify the sources of a target organization's growth. Analytical models can evaluate the impact of specific aspects of the target's business on key growth indicators. This will reveal its true drivers. As a supplement, AI-assisted search can complement detailed analyses of internal data about the target's customers, products, operations, and cashflows. For example, it can identify and assess data from external sources for additional insight into whether a specific customer segment, product, or market is driving the company's growth. Analytics and AI provide a higher likelihood of finding useful insights because they can identify, define, and prioritize correlations across far more data points.

Figure 13

Application of analytics and AI to analyze margins



Survey question: How are you applying AI in the negotiation step?

Insight: Robotic process automation (RPA) in due diligence

During due diligence, robotic process automation (RPA) tools can be applied for repetitive, time-consuming tasks such as data entry and the categorization of document contents. RPA tools can then automatically route materials to the correct reviewer(s). Other examples, to name just a few, include trawling through detailed financial data, analyzing business processes, scrutinizing contracts, assessing technical developments and assets, gauging staff deployments, and evaluating product lines.[12] Since RPA can perform certain activities at scale, it frees human M&A experts to evaluate other areas where their expertise adds value: design, organizational culture, and executive and staff alignment with the acquiring organization.

Evaluate the effectiveness of a target's customer retention capabilities. NLP, together with sentiment analysis, can determine customer responses to the merger. As a result, customer retention efforts can be focused on key targets and adjustments to product/service portfolio and geographical targets can be made.

Understand a target's margins over time. Extensive automation supports thorough examination of the many quantitative and qualitative factors that influence profit margins. Financial analysis software tools have long been applied to summarize historical transaction-level revenue and cost data for different geographies, customer segments, and product lines. Predictive analytics, scenario planning, and game theory provide a forward-looking perspective. For example, developing a variety of scenarios that impact the cost and profit of products or services can highlight potential future problems and recommend actions to eliminate or reduce their impact.

4. *Analyze synergies*

Forty-four percent of chemicals and petroleum M&A leaders are employing analytics and AI to assess synergies, versus a little over a third of all others.

Identify potential synergy opportunities. Advanced tools can identify and evaluate prospects for the merged organizations to generate more profits or reduce costs. Because those synergies play a critical role in valuation and are often used to justify paying a premium, they must be accurately reflected in financial models and communications to investors and markets.

Forty-four percent of chemicals and petroleum M&A leaders are employing analytics and AI to assess synergies, versus a little over a third of all others.

Realize and optimize deal value

During integration, two activities augmented with analytics and AI—integrate for value and extract new value—translate data captured during due diligence and pre-close negotiations and use it as the basis for additional analysis, detailed integration planning, and detailed synergy execution plans.

1. *Integrate for value*

More chemicals and petroleum M&A leaders are leveraging analytics and AI to capture value (see Figure 14).

Gain insight into optimal business activities between the merged organizations. Algorithms can find alternative distribution sources or paths to market through relationships or partner networks. Analytical models can evaluate supply chain or operations and discover ways to optimize assets, efficiency, and effectiveness for the new company. These tools can also identify and calculate internal efficiencies from updating legacy systems, especially ERP and duplicated production systems, consolidated data centers, platforms, and other assets.

Track synergies and forecast the probability of achieving them. Analysis of the financial performance of previous, similar deals can highlight areas where financials could outpace the business case. Then, using predictive analytics, the likelihood of hitting performance targets can be calculated and automatically update forecasts.

Identify risks that warrant prioritizing; suggest actions to mitigate risks that could become critical. During integration, high-priority, high-complexity initiatives have multiple associated risk factors. Analytical models can determine the probability of a major risk occurring and the impact it will have for risk scenarios. These models can also be programmed to provide recommendations on potential mitigation plans.

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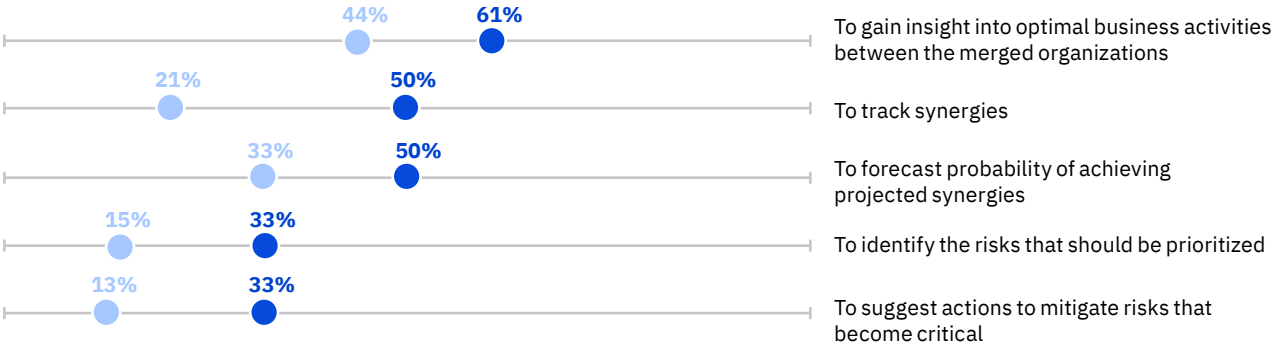
Figure 14

Application of analytics and AI to integrate for value



Survey question: How are you applying AI in the integration step?

Insight: Performing comprehensive cybersecurity due diligence

Create a M&A cybersecurity assessment checklist and take the following actions:

- Conduct a third-party cybersecurity audit of the information systems being acquired to detect vulnerabilities and assess the current state of cybersecurity
- Take careful stock of the organization's technological assets and liabilities—especially in emerging technologies—before completing acquisition formalities
- Take advantage of third-party services to assess the cybersecurity posture and maturity of the organization being acquired
- Assess the resilience posture of the target acquisition's third-party vendors.

Consider other M&A security factors. These include IT security expenditures, future cybersecurity plans, certifications, cyber-insurance policies, employee background verification and off-boarding, security operations centers (SOCs), and cybersecurity awareness programs. Other factors include vendor risk assessments, authentication and access controls, encryption, network monitoring, disaster recovery and business continuity planning, organizational structure, and the information security reporting chain.[13]

2. *Extract new value*

M&A offers chemicals and petroleum companies an opportunity to deliver real change to their organizations during the post-close integration period. Forty-one percent more chemical and petroleum M&A leaders are using analytics and AI to capture additional value, compared to just 26 percent of all others.

Identify other potential value-creation opportunities between merged organizations. Analytics can highlight where renegotiating contracts can achieve cost savings or new revenue sources. Predictive models can identify cost drivers in customer service processes or identify the root cause of product/process failures and highlight areas for improvement. Deeper IT and systems audits allow for better planning and updates to benefits realization.

A conceptual architecture to create the foundation for modern M&A

The complexity of M&A encompasses multiple stakeholders. A conceptual, domain-specific architecture sets the foundation for implementations of M&A capabilities. This architecture supports conversations with stakeholders responsible for data, technology, risk, cybersecurity, and regulatory compliance (see Figure 15). It supports both the organization and its advisors during evaluation and synergy development, addresses non-disclosure and anti-competitive requirements, and helps enable a more robust review of the market. It allows for multiple M&A "clean rooms" with rigorous permissions, gating, and regulatory requirements.

The conceptual architecture consists of a data layer and an insights layer.

Predictive models can identify cost drivers in customer-service processes or identify the root cause of product/process failures.

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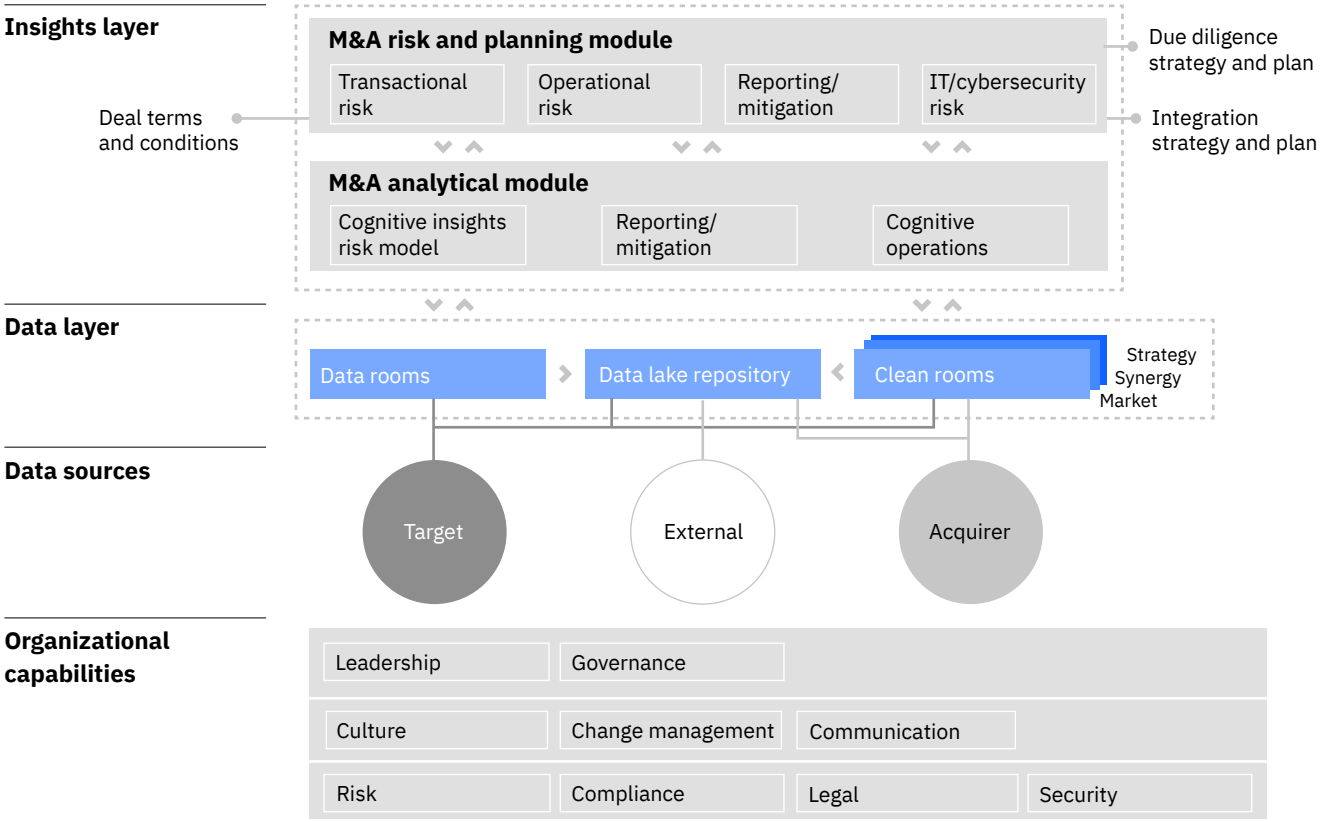
Figure 15

Conceptual architecture for modern M&A



Source: IBM Corporate Development research. Unpublished data. September 2019

The data layer: Fueling M&A analysis and decisions

The data layer is where data sets (of all types and from multiple internal and external sources) are integrated, stored, and managed. These data sets are required to feed the analyses performed throughout the M&A lifecycle.

In M&A, data needs to be acted upon quickly, yet it's seldom available on day one. As soon as possible, curate and collate data. Create a continuous method for capturing M&A data, building a rich collection that can be accessed quickly for analytic use. At the core is a data lake that can access and integrate data from other repositories, such as:

- Internal historical deal and risk data collected for each deal pre-close and refined during post-close integration. (With the application of analytics and AI, the knowledge and insights yielded can be applied indefinitely.)
- Data rooms that house raw internal data provided by the target for due diligence
- Clean rooms that house internal and proprietary data from both target and acquirer
- Other external sources that provide information on historical M&A deals, business news sites that yield insights and perspectives on market trends, emerging threats, and market sentiments—to name just a few.

Corporate development, and M&A in particular, will always be a human-plus-machine partnership.

This data creates opportunities for collaboration across the target, the potential acquirer, and third-party advisors.

Validating source data before it is used and implementing adequate protection for sensitive information—particularly what can be shared and with whom—are critical to achieving a win-win of consistency, transparency, and compliance. Rigorous organizational cybersecurity standards should be applied here as well.

The insights layer: Launching analytics and AI applications

The insights layer is where analytics and AI are leveraged. It is composed of two interconnected analytical modules that interface with M&A-specific tools and enterprise applications for AI and analytics. Each module has a specific focus:

1. The M&A analytics module uses tools that apply advanced analytical techniques to gain optimal value via new insights from the varied data sources.
2. The M&A risk and planning module applies analytical tools and techniques dedicated to continually monitoring data and identifying, predicting, and mitigating risk.

This architecture cannot deliver successfully without the support of critical organizational capabilities. Representatives from leadership, governance, communications, risk, security, compliance, legal, culture, and change management all participate.

To support the design and implementation of automated M&A analytical models, data scientists and analysts should be part of the corporate development team. For AI to be effective, business decision makers need an understanding of the tools and how predictions are made.

Continuous learning and innovation, with the constant testing of new approaches, are important for culture. Building proofs of concepts can indicate which outputs are valuable. These insights can be applied to update and improve analytical models.

Are you ready to elevate your M&A performance?

Corporate development, and M&A in particular, will always be a human-plus-machine partnership. The complexity of products/services, markets, and revenue models necessitates an executive focus on technology-enabled M&A approaches and strong governance and execution.

As chemicals and petroleum companies adopt automation, analytics, and AI, they should dedicate resources to assess the value those technologies can add to corporate development. We have seen that leaders extend automation, analytics, and AI in the M&A lifecycle and demonstrate the success of digitized, modern M&A.

Exploring these questions can help you move forward on your M&A journey.

- How effective is your organization in bringing together data from various sources to identify M&A opportunities?
- By what processes does your organization build living business cases that update throughout the M&A cycle to determine the fastest, strongest courses to value?
- What steps have you taken to reduce time to decision? How do you increase the success of your decisions?
- Where have you developed and deployed AI-powered analytics to mitigate M&A risks? How can you address risks earlier in the process?
- How frequently do you create detailed integration and synergy execution plans prior to deal closure and update them post-close?

Action guide

Modernizing chemicals and petroleum M&A with analytics and AI

Organizations can take four steps to build a modern M&A capability that can drive effective, inorganic portfolio growth:

1. Establish a domain-specific conceptual M&A architecture to set the foundation for dialogue across diverse stakeholders

- Include a data layer where data sets of all types and from multiple sources are integrated, stored, and managed. These data sets fuel analyses throughout the M&A life cycle
- Incorporate an insights layer where analytics and AI are leveraged. Design an M&A analytics module that uses advanced analytical techniques to gain new insights. And develop an M&A risk and planning module that continually monitors data and helps identify, predict, and mitigate risk.

2. Set a proper M&A governance and execution model

- Use a centralized governance model with dedicated corporate development M&A groups driving process and strategy across business units. This allows companies to adapt to a more portfolio-based approach with scale to manage multiple transactions simultaneously
- Tap external resources during the deal process to supplement the company's internal capabilities and provide objectivity with sourcing potential targets and negotiations. Augmentation from third-party accountants and lawyers provides expertise that may not exist in-house, and internal resources may not have the time. External resources can also help test due diligence hypotheses. This could include asset appraisals, environmental testing, cybersecurity audits, IT assessments, and market analysis
- Move post-merger integration and IT, and cybersecurity risk and compliance activities earlier in the M&A process. The integration team, as well as the CISO, should engage during the strategy and screening processes. The advantage is more time to identify all the activities that must happen prior to day one, make key decisions, and set the integration team in place. From a risk and compliance perspective, earlier is better in uncovering cybersecurity issues, non-compliance, and associated liabilities so they can be accounted for in the deal price.

3. Implement M&A workflow and process automation

- Tap workflow to assist with M&A management. This can include scheduling, tracking of timelines, collaboration in real-time and approvals
- Leverage automation to help with data transfer/integration and connection of systems of the buyer with the target.

4. Augment the M&A lifecycle with analytics and AI

- Consider the value of a broader set of potential acquisitions in strategy and screening
- Apply analytics and AI to understand and mitigate value at risk once the most promising target has been identified in due diligence, negotiations, and transaction execution
- In integration, leverage data captured during due diligence and pre-close negotiations as the basis for detailed integration planning, and detailed synergy execution plans. This additional analysis supports realizing and optimizing deal value.

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Study approach and methodology

For the 2019 Cross-Industry M&A Benchmark Study, the IBV surveyed—in cooperation with Oxford Economics—720 leaders with overall accountability for the M&A process in their organizations. This responsibility encompasses strategy definition to post-merger integration. All respondents are from acquiring organizations that had fully executed at least one major M&A transaction in the last two years or were planning to execute a major M&A transaction in the next year. These individuals included Chief Executive Officers and Chief Financial Officers, as well as Heads of Corporate Development and Corporate Strategy.

The three industries represented include electronics, chemicals and petroleum, and healthcare/life sciences. Each comprises approximately a third of our total sample. The 18 countries in our survey include all major geographies.

Our goal was to understand what makes some acquirers achieve better outcomes from their M&A activity. In order to achieve this, we benchmarked the performance and maturity of organizations' M&A or Corporate Development functions and capabilities. An online survey was administered in two parts:

- The first collected data about the organizational and technical capabilities organizations have implemented to support the end-to-end M&A process
- The second collected cost, cycle time, quality, and efficiency metrics related to the end-to-end M&A process.

We organized the 220 chemicals and petroleum respondents into two groups: those with mature M&A organizational capabilities and processes and those that were less mature. The more mature group—the M&A leaders—comprise 29 percent. The less mature group account for the remaining 71 percent. Both groups benefit from their M&A activity, but M&A leaders achieve higher gains across all aspects of performance.

To understand the factors contributing to this superior performance, a detailed comparison revealed key differences in the M&A operations of M&A leaders and other chemicals and petroleum companies. The most significant of these is the extent to which they apply analytics and AI to support activities throughout the M&A process.

All data is self-reported, financial or otherwise.

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