

# *Using advanced analytics to make Big Decisions*

*PwC's Global Data and Analytics Survey 2016: Big Decisions™ India insights*





# Towards a data-driven future

Over the last few years, digital acceleration, coupled with global shifts in economic power, has altered the playing field for companies around the world. Advanced analytics and machine learning—technologies that once seemed like beacons from a distant future—are increasingly available and accessible to businesses.

The ability to make intelligent decisions that drive growth, disrupt the market and capitalise on emerging opportunities is now linked less to gut feeling and more to predictive and prescriptive analytics, artificial intelligence and data-driven insights. Gaining a competitive advantage is no longer about accepting the status quo or relying on age-old traditions. It's about mustering the courage and commitment to harness both mind and machine.

Our most recent Global Data and Analytics Survey (2016)<sup>1</sup> involved the participation of more than 2,100 global executives (globally) and more than 100 Indian executives, ranging from C-suite leaders and departmental heads to managers and analysts.

The survey aimed to understand the extent to which executives and managers view their organisations as data-driven, how mature their current usage of analytics is, and the key challenges they face in employing data to drive the next big decision, including the need for improvement in the speed and sophistication of the decision-making process itself.

The results suggest that Indian organisations are more confident about the future as 83% of the respondents felt that the changes would be gradual, as opposed to the global figures of 66%.

## Drivers of big decisions



### Creative

(stable core activities but new core assets; playing fields evolving)

**56% India**

**43% Global**



### Incremental

(status quo preserved; incremental progress)

**27% India**

**23% Global**



### Intermediating

(core activities threatened; relationship fragile)

**6% India**

**23% Global**



### Radical

(game changing; everything up in the air)

**11% India**

**14% Global**

Source: PwC analysis

<sup>1</sup> PwC. (2016). Global Data and Analytics Survey 2016. Retrieved from <http://www.pwc.com/us/en/advisory-services/data-possibilities/big-decision-survey.html>

The recurring themes that emerged from the global survey results were general anticipation of industry changes within the next 5 years—predominantly the opening up of new playing fields for companies to venture into while maintaining their core activities.

Further, 43% of the Indian executives considered their next big decisions to be developing new products and

services and entering previously untapped markets. Their motivation is to bring out more innovative products, improve customer acquisition, increase market share and finally create shareholder value.

We have explored the Big Decision Survey results and technology advancements across the following six themes.



Speed and sophistication



Data-driven decision making



Type of analytics



Mix of mind and machine



Driving functions for analytics adoption



The road ahead

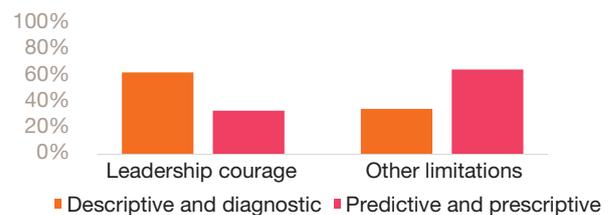
Some of the key highlights of the survey are as follows. Nearly 98% of the Indian respondents were found to believe that their organisations were highly (61%) or at least somewhat (37%) data-driven and indicated that descriptive and predictive analytics were currently employed in their organisations to drive decisions.

However, they anticipated, on an average, a 15%–20% improvement in the sophistication and speed of decision making to be necessary in order to draw insights and drive decisions from data within the next 5 years. Moreover, they realised the need to cover the gap between the current and future levels.

**A data-driven culture and forward-looking analytics generate certainty and optimism about taking big decisions.**

Usage of advanced analytics such as predictive and prescriptive analytics in organisations to support decisions was associated with greater certainty and optimism among company leaders regarding their next big decision and its likely impact. Nearly 64% of the respondents who saw leadership confidence as a likely challenge to decision making—as opposed to other factors such as policy regulations and budgetary constraints—also perceived their firms to be purely dependent on descriptive and diagnostic analytics.

Analytics usage vs leadership courage as a limitation on decisions



Source: PwC analysis

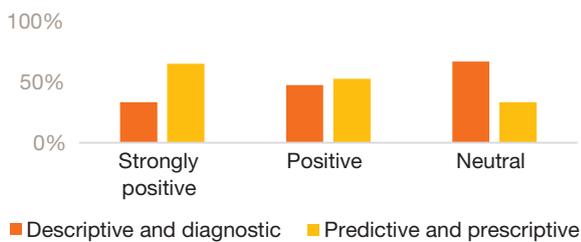




Further, Indian executives who stated that their firms used predictive and prescriptive analytics were more strongly optimistic about their next big decision than

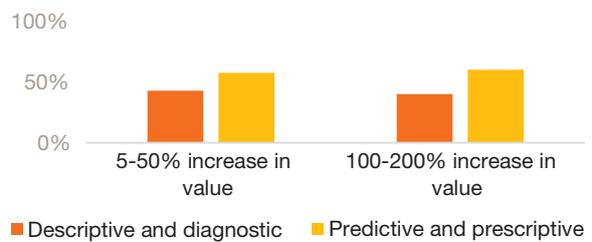
those using basic analytics. This group also indicated a higher potential for shareholder value creation from their decisions.

Analytics usage vs optimism about decision



Source: PwC analysis

Analytics usage vs expected gain in shareholder value

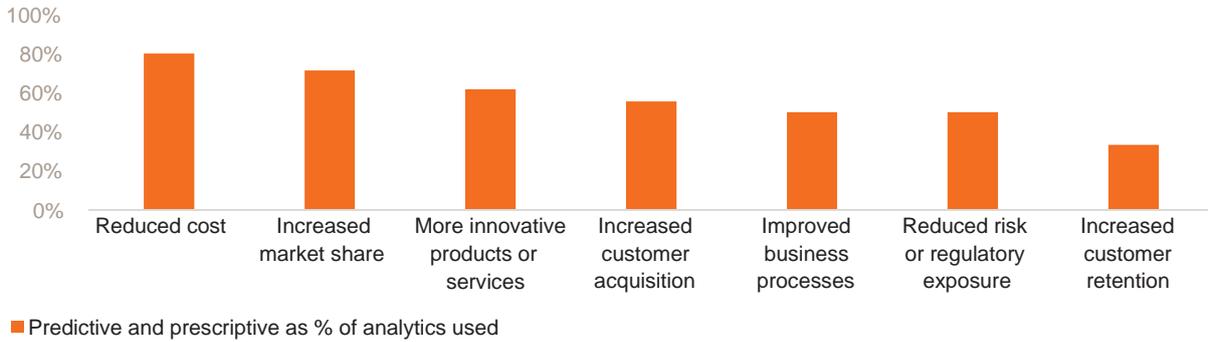


Source: PwC analysis

**Cost reduction and market share gains are the big focus areas for Indian firms while leveraging advanced analytics solutions.**

Companies that rank high on usage of predictive and prescriptive analytics envisioned cost reduction (80% of the respondents) and increase in market share (71% of the respondents) as the likely positive outcomes from the next big decision.

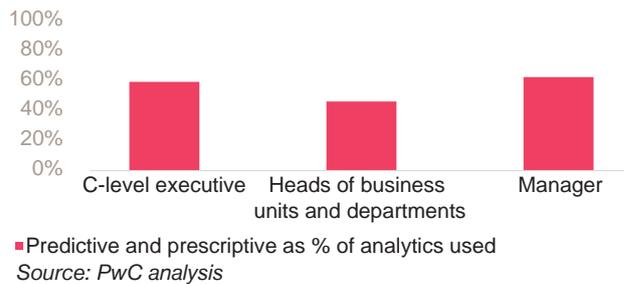
Advanced analytics share of usage vs impact of big decision



**C-level executives are more confident of their firm's data and analytics maturity as compared to mid-level executives.**

C-level executives considered their firms to be highly data-driven and users of predictive or prescriptive analytics (59%). Among the next tier of management—namely business unit and department heads—the percentage falls to 46%, suggesting a gap in the extent to which analytics is actually being leveraged for decision making across different levels.

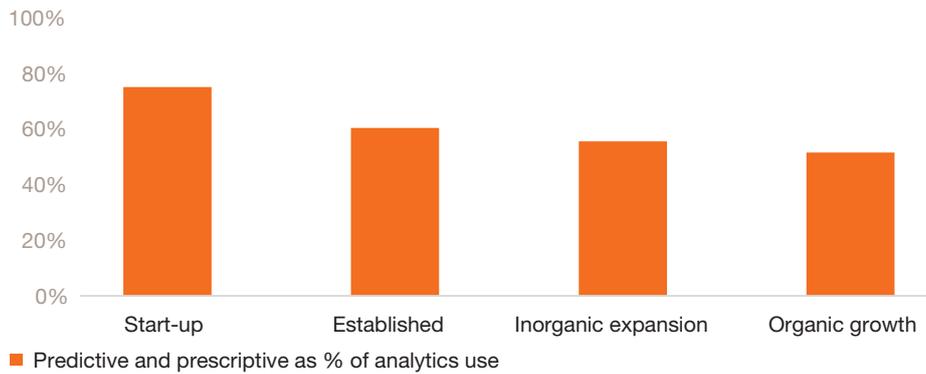
Advanced analytics share of usage vs respondent role



**New age firms and start-ups are better equipped than established players in their usage of advanced analytics for decision making.**

Company size (by revenue) does not necessarily correlate to greater investment in advanced analytics capabilities. Companies with relatively smaller revenues and, in particular, start-ups indicated predictive and prescriptive analytics to be deeply embedded in their operating model and processes (75%), with 15% more respondents stating that their firms used advanced analytics compared to more established firms in their industry.

Advanced analytics share of usage vs company growth phase

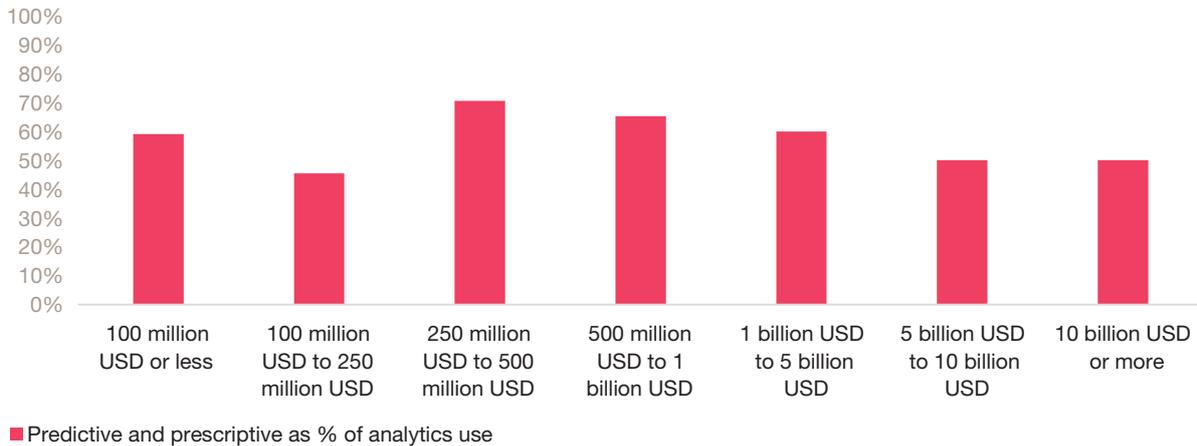


Source: PwC analysis

This result may be attributed to the fact that many recent start-ups as well as fast-growing firms have built their business and operating model around leveraging advanced analytics—examples being e-commerce players, app-based cab services, and payment banks and portals. An emphasis on the

data infrastructure to capture, store and draw insights from comprehensive and accurate data; access to a skilled workforce; and smaller size—which translates into more uniform adoption of analytical tools and algorithms across the organisation—have facilitated rapid growth.

Advanced analytics share of usage vs firm revenue



Source: PwC analysis

The challenges to effective strategic decision making are rooted in leadership concerns, budgetary considerations, and lack of manpower and resources. These

shortcomings need to be addressed in order to respond quickly and effectively in an environment of uncertainty, change and opportunity.

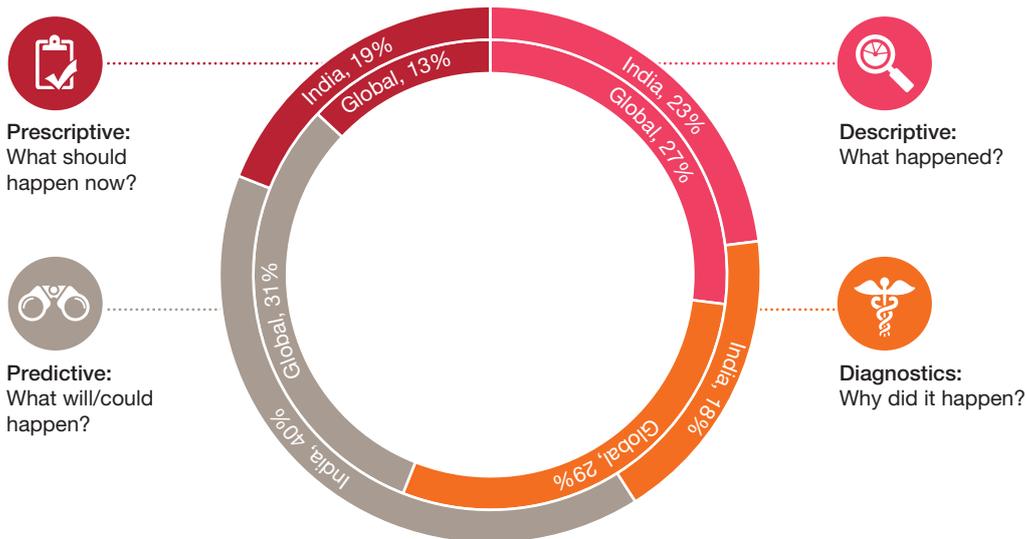
# Type of analytics used by organisations

A comprehensive analytical programme needs to have the right mix of descriptive, diagnostic, predictive and prescriptive capabilities. The complexity and maturity of analytics modelling techniques also move in the same order, starting with descriptive analytics and moving towards prescriptive techniques.

- Descriptive analytics finds what is currently happening or has happened. It improves the understanding of past performance, identifies historical trends and monitors the performance of actions.
- Diagnostic analytics identifies why outcomes, events or trends occurred. It provides greater visualisation of the data, identifies relationships and explains the outcome.

- Predictive analytics anticipates future behaviour or estimates unknown outcomes. It discovers hidden relationships among various factors in order to predict the outcome of future events.
- Prescriptive analytics helps to specify a preferred course of action. It optimises decisions by efficiently allocating resources or finding the most suitable way forward.

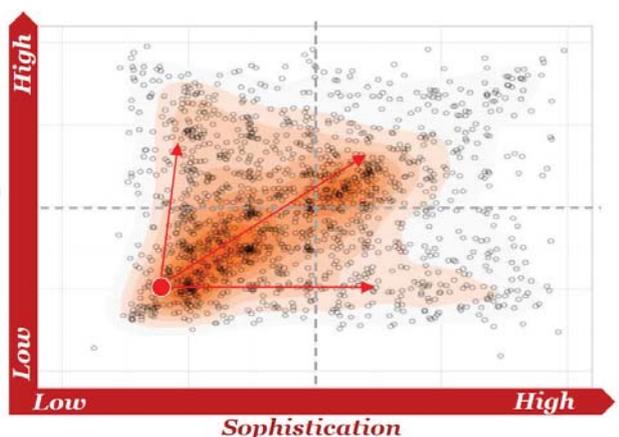
The Big Decisions Survey highlights that the use of analytics is mostly restricted to descriptive and predictive, with relatively limited use of prescriptive analytics as yet. However, Indian leaders score higher (40%) than their global counterparts (31%) in terms of deploying predictive modelling techniques for decision making. Similarly, Indian leaders have shown greater preference for prescriptive analytics (19%) as compared to global leaders (13%).



# Speed and sophistication

In the swirl of clickstreams and sensor streams, the speed at which businesses make decisions and the

sophistication of the techniques used to find insights matter a lot.



Source: 'The power of analytics for better and faster decisions' – WEF Annual Meeting presentation

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**Speed** is measured based on the time taken to answer questions, time to decide action and time to implement measures.

**Sophistication** of decisions is decided by analytics maturity, data breadth and depth, and decision-making approach.

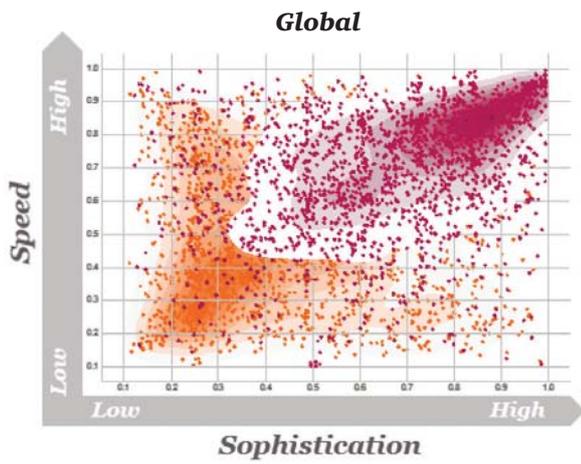
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Improving both speed and sophistication will help increase the return on investment for data and analytics. With the cycle of innovation narrowing, organisations cannot take months, or even weeks, to analyse an opportunity. They must increase the speed at which they make decisions while applying the right insight to their problems using more sophisticated data analytics. The key challenges that need to be overcome are data quality, readiness of systems to deal

with multi-format data and analytical skills to perform insightful analyses.

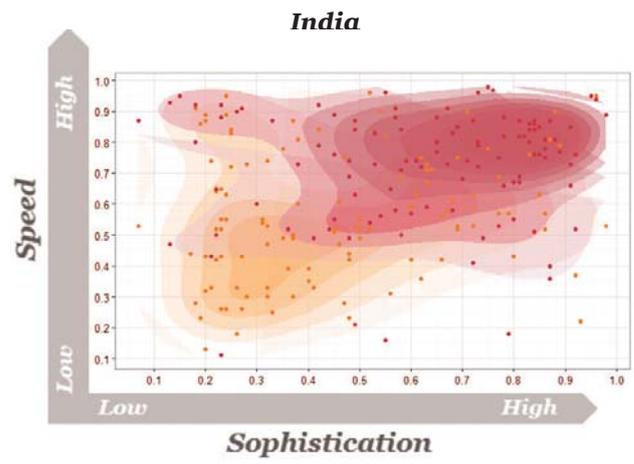
The survey results show the current level of speed and sophistication in orange, while magenta indicates the level that companies aim to reach by 2020. This survey also reveals that Indian organisations are currently at higher levels of speed and sophistication as compared to global organisations, which display a significant gap between their current state and future expectations.





Source: PwC analysis

The gap for Indian firms in terms of speed and sophistication of decision making (18% gap in sophistication and 16% gap in speed) is lower than that of their global counterparts (21% gap in sophistication and 20% gap in speed respectively).



Source: PwC analysis

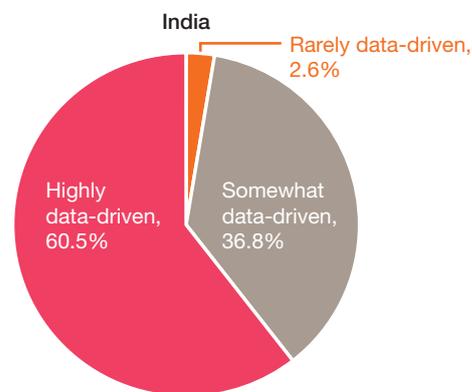
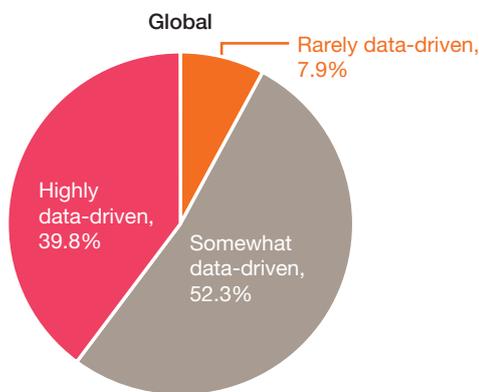
While the gap is low for India, Indian organisations have considerable room for improvement in terms of speed and sophistication compared to some of their global counterparts.



# Data-driven decision making

To retain their positions as market leaders, companies must establish a data-driven innovation culture. The availability of data is not a new thing; however, the number of sources has risen exponentially. Moreover, the volume of data available is set to increase further in both structured and unstructured formats. This will expand the already sizeable group of executives who believe it is critical to generate data insights from their companies' products or services.

The survey revealed that 61% of Indian leaders believe that their organisational decisions were highly data-driven compared to the global benchmark of approximately 40%. Business leaders in India have recognised the critical importance of data and analytics for successful modern business. They feel that analytics can transform their ability to access and use information from their customers, suppliers, employees and other stakeholders.



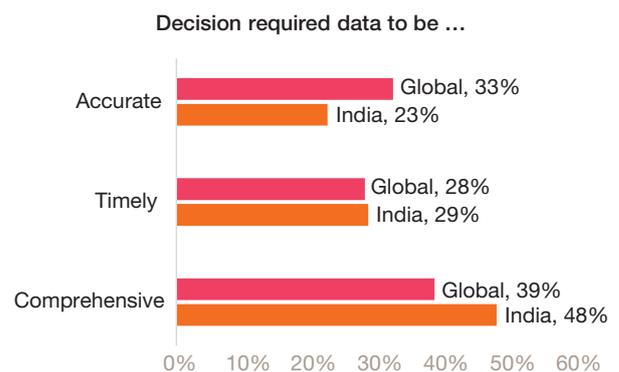
Source: PwC analysis

For companies that already have a head start in data-driven decision making, the most popular initiatives are to make greater use of specialised analytical tools and techniques, to employ a dedicated data insights team to inform strategic decisions, and to rely on enhanced data analysis—each of which has been started by over one-half of these companies.

Indian respondents place high importance on comprehensive data as a facilitator for decision making (48%) as compared to accuracy and timeliness. Globally, respondents consider comprehensive and accurate data to be a pre-requisite for decision making.

Over time, more people have become involved, and a majority of firms have incorporated a more data-driven decision-making process.

Establishing clear decision rights and accountability is crucial, and a similar discipline must be applied to the amount and type of data being collected and analysed to avoid overload.



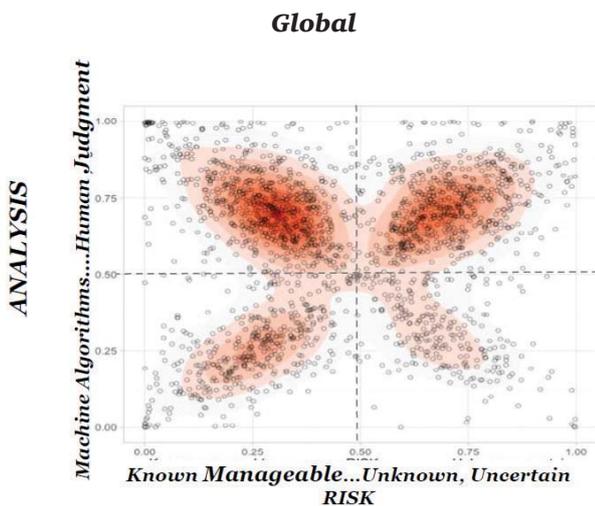
# Mix of mind and machine

Strategic decisions are often based on human instincts. To gain a competitive edge, advanced machine learning techniques should be used to complement experience and intuition, and support the volume and frequency of decisions. The use of data analytics and emerging technologies can help an organisation uncover patterns that lead to new predictions.

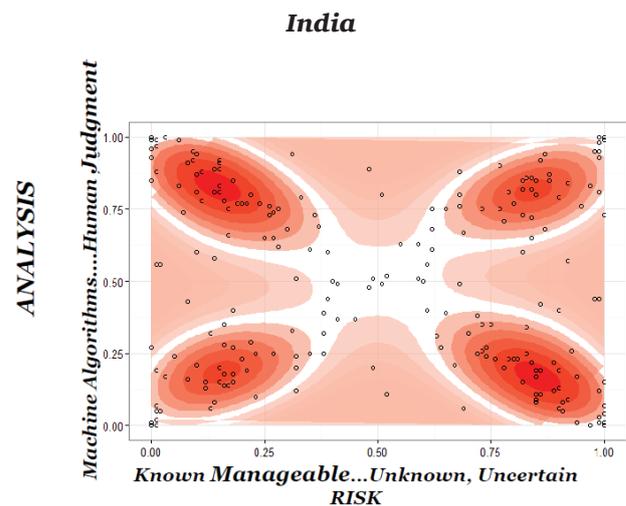
At the same time, it's important for all organisations to understand and manage risk in their day-to-day operations and strategic decisions. Analytics makes it possible to assess risks that were previously seen as unquantifiable. This creates an opportunity for organisations to better manage their risk and make sure that an appropriate return is being achieved.

Respondents were asked to rate their organisation on two parameters. First, on how analysis is performed—whether it is human judgement driven or based on machine algorithms. Second, on how they perceive the future risks to be—whether they will be known and manageable or unknown and uncertain.

The Big Decisions Survey results show that 43.65% of Indian leaders use machine analysis/algorithms as compared to 41% of global leaders. On the human judgement parameter, Indian leaders had a score 56.34% as compared to 59% for global leaders. These statistics clearly demonstrate that Indian leaders trust analytical tools and techniques while taking important decisions as against relying on their instincts.



Source: PwC analysis



Source: PwC analysis

A wide variety of machine algorithms are being used for developing analytical models for solving different business issues:

**Cluster analysis:** The task of grouping a set of objects in such a way that objects in the same group (cluster) are more similar, in one sense or another, to each other than to those in other groups (clusters)

**Regression analysis:** A statistical process for estimating relationships between a dependent variable and one or more independent variables

**Decision tree analysis:** A decision support tool that uses a tree-like graph of decisions and their possible consequences, including chance event outcomes and resource costs and utility

**Time Series analysis:** Comprises methods for analysing time series data to extract meaningful statistics and other characteristics of the data

**Factor analysis:** Used to analyse large numbers of dependent variables to detect certain aspects of the independent variables (factors) affecting those dependent variables

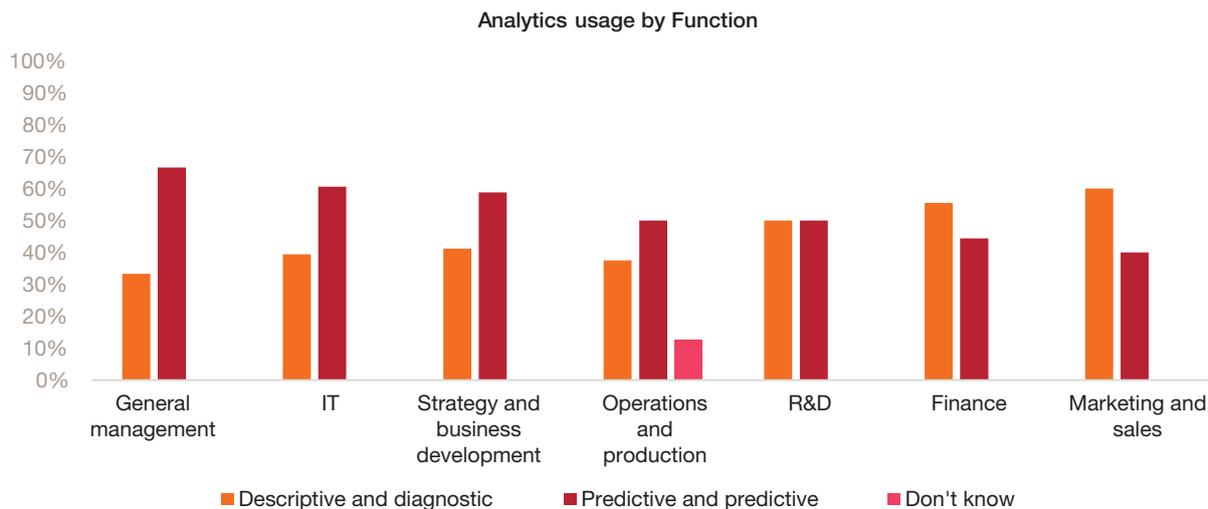
Machines won't replace human judgment, but the right mix of mind and machine can reduce the impact of human bias, yield more accurate answers and de-risk decisions—even for complex problems.

The cost of technology is falling, opening up many more sources of data, synthesised from both internal and external sources and a variety of machine learning algorithms. This gives company executives real-time confidence around the happenings of their organisation. Individuals can use data to connect the grass roots of an organisation to the boardroom in a quick, effective and confident way. This enhanced visibility means that strategic decision making becomes more proactive and less reactive.

# Functions driving analytics adoption

The survey reveals that the leading functions in terms of analytics adoption in organizations are IT, Strategy & business development and General Management

which show a high usage of predictive and prescriptive analytics (over 50% respondents) alongside the descriptive and diagnostic forms.



Source: PwC analysis

Overall, it can therefore be said that over the short term, an IT department will have a major role to play in establishing the infrastructure and data pre-

requisites and developing the right skills and insights in order to institutionalise data-driven decision making in organisations.



# The road ahead

Big decision making is changing. Many business leaders now have enriched information to draw upon before making a choice about the direction in which

they'd like to take their company. That being said, they need to consider the following five steps before arriving at their next big decision:

## Five steps to consider before your next big decision



### Keep an open mind

Data analysis is not limited to recurring decisions. Some executives already rely on it for one-off decisions, such as identifying a potential mergers and acquisitions target.

1



### Unlock existing insights

Data does not have to be 'big' to be useful. Analysing databases previously mothballed or kept in silos can lead to fresh insights.

2



### Understand inherent bias

Important decisions have already been taken before data analysis is presented to senior executives. Get to know what lies behind your dashboard.

3



### Invest in talent

Before recruiting new data scientists to staff your data insight teams, consider providing existing employees with a foundation in data analysis.

4



### Take the lead on accountability

Being clear about who has decision-making rights can improve outcomes. Opening up access to data and analysis can allow decisions to be challenged.

5

The reshaping of businesses kicked off by the global recession is set to continue. Although this should offer up plenty of opportunities, these decisions will be taken in an uncertain economic environment, often as a reaction to changes beyond the decision maker's control. More people have become involved, and a majority of firms have incorporated data and analysis in their decision-making process. This has mostly been for the better; however, potential pitfalls remain. Establishing clear decision rights and accountability is crucial, and similar discipline must be applied to the amount and type of data being collected and analysed to avoid overload.

While many organisations have started their analytics journey and are at various stages of maturity, they are still struggling to identify the most appropriate model for sustainable analytics implementation. They can adopt analytics across their enterprise using various options:

- **Organic in-house:** An organisation augments its in-house analytics team over a period of time and

introduces analytics in a phase-wise approach. However, this is a slow process and the time to first insight increases drastically.

- **Inorganic in-house:** In this case, an organisation buys an analytics company which can start working on various analytics projects across the enterprise. This approach can improve the time to value. However, integration issues might cause the analytics resources to take some time to understand the organisation's processes and culture.
- **Primarily outsourced:** In this case, the entire analytics work is completely outsourced to an external vendor who ingests the various data feeds from the retailer, performs the analysis and sends the results and insights back to the retailer. This approach can deliver quick results, but in the long run, it can prove to be an expensive proposition for the organisation due to reliance on the external vendor, along with loss of control on analytics operations.

- Hybrid model (recommended):** This model is a combination of in-house and outsourcing approaches. It helps the organisation in countering the challenges in terms of availability of skilled resources and investing a huge amount of money upfront. An external consultant works with the organisation to set up an analytics centre of excellence and to co-create various analytics models on its premises. This not only helps in gaining access to the latest best practices prevalent in the market but also keeps the retailer in control at all times.

Whatever the business issue or industry sector, organisations need to draw upon a number of core building blocks to capture and manage data, analyse it to release insight and ensure it drives business change going forward.

	Organic in-house	Inorganic in-house	Primarily outsourced	Hybrid Model
Time to value	✘	↔	✓	✓
Total cost of ownership	↔	✓	↔	✓
Access to latest best practices	✘	↔	✓	✓
Control of operations	✓	✓	✘	✓

Source: PwC analysis

Suggested approach



# *Our Data and Analytics practice*

Our Data and Analytics practice has been working with leading organisations across the globe, helping them with strategy and needs assessment, benchmarking, process management, vendor and tool evaluation, model implementation, financial modelling, analytics competency centre set-up as well as support and change management. We have executed multiple projects across

the retail and consumer, insurance, banking, private equity, manufacturing, mining and utilities, telecom, automotive, healthcare, pharma and government sectors.

We are experts in implementing analytics solutions through leading market tools, by aligning them to the client's technology landscape.





Manufacturing



Time Delay

4-Quadrant Tooling

# Contact us

For a deeper conversation on how technology can help with your big decisions, please contact:



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