Big data in asset management

Going beyond the hype

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Table of contents

Executive summary

Unlike hedge fund managers, traditional asset managers have been a late adopter in leveraging big data. However, their interest in big data has surged of late, driven by its potential to deliver superior insights. In our survey, conducted as part of CRISIL GR&A's recent conference titled 'Big Data in Asset Management', over 70% of the respondents considered big data investments important.

In the constant search for alpha, signals generated by alternative data such as transaction data, satellite imagery, weather pattern data, package delivery data and social media are becoming increasingly important. Big data applications now extend beyond investment management to the areas of sales and marketing, compliance and risk. However, given the substantial investment requirements, asset managers are increasingly tapping into external consultants and niche service providers such as CRISIL to execute big data pilot projects, rather than invest in full-scale infrastructure and additional staff.

A key challenge faced by asset managers is securing access to reliable, potent and unique big data. Asset managers must conduct due diligence and ensure data quality when using external partners. In our survey, identifying the right data sources was ranked as the biggest challenge by more than half of the respondents. Another challenge for asset managers is ensuring the big data-driven models are periodically reviewed and refined, for they could lose their edge as the external environment changes. Additionally, creating new big data strategies are necessary as competitors ape successful strategies.

The significant investments required in technology and people are another challenge for asset managers. The problem is that of many – there are one too many ideas - and the asset managers have the difficult task of choosing where to spend their time, money or effort. As a result, asset managers are doing one of the two things at this stage – either evaluating data sources or commissioning projects and proof-of-concept to evaluate ways of integrating big data with their existing investment research process. Some asset managers, who do not want to get concerned with plausible non-exclusivity issues, are investing and developing in-house proprietary data sources.

Given these challenges, we believe that asset managers should implement big data analytics in a phased manner. A senior quantitative leader and industry practitioner, who was the guest speaker at our recent conference, believes that Asset Managers should initially commence an analyst-driven project model that leverages existing infrastructure and technology, external consultants and niche service providers. This can be followed by a more centralized, specialized skill-based approach leveraging new-age technologies. In our survey, we found that about 70% of the firms plan to create cross-functional teams with a mix of internal and external people consisting of quants, data scientists, and fundamental analysts, while just under 60% of firms plan to exclusively explore off-the-shelf solutions and collaborate with external consultants and niche service providers.

We believe that big data investments by asset managers will continue to gain traction — over 80% of the respondents expect their respective firms to increase big data analytics investments in 2017. Big data applications are not just restricted to active funds: smart beta products and related factor-based analytics are likely to continue growing as sophisticated and new factors emerge, supported by big data. We also see adoption of big data at a firm-wide level, supported by increasing collaboration with technology firms, consultants and universities. It is likely that a few years from now big data will be an integral part of the investment research process.
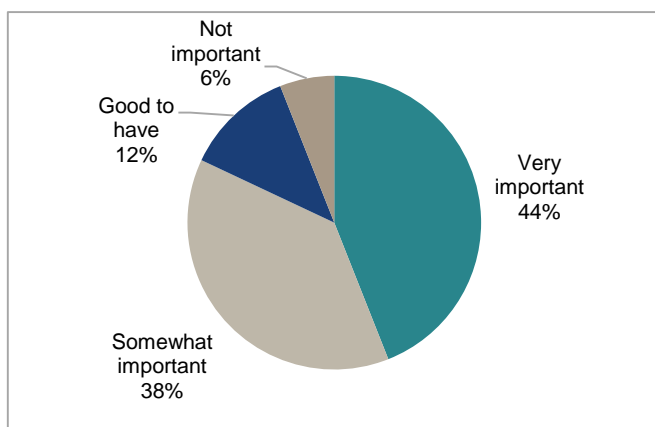
Emerging big data trends in asset management

Traditional asset managers embracing big data, albeit cautiously

Over the past few years, big data technology and analytics have attracted widespread interest, given their potential to deliver better insights than traditional platforms and the falling costs of technology infrastructure. Unlike hedge funds, traditional asset managers have been late adopters of big data, but their interest in it has been picking up. Traditional investors are now looking into big data techniques to integrate with their primary fundamentals-based investment strategy. For example, BlackRock is attempting to have its Active Equity and Scientific Investing teams collaborate with each other[1].
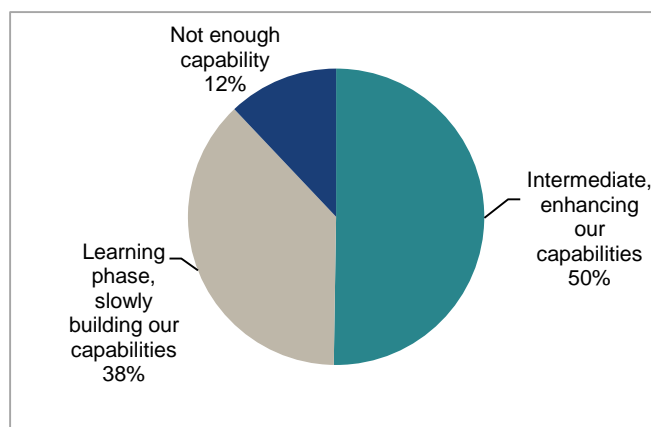
In a recent survey conducted as part of CRISIL GR&A's recent conference on 'Big Data in Asset Management', held in New York, over 70% of the respondents rated big data investments as 'Very Important' or 'Somewhat Important'. However, about 50% of the respondents said they did not have adequate big data capabilities or were in the initial stages of building their big data capabilities.

Importance of big data investments

Source: CRISIL Global Research & Analytics

In-house big data capabilities

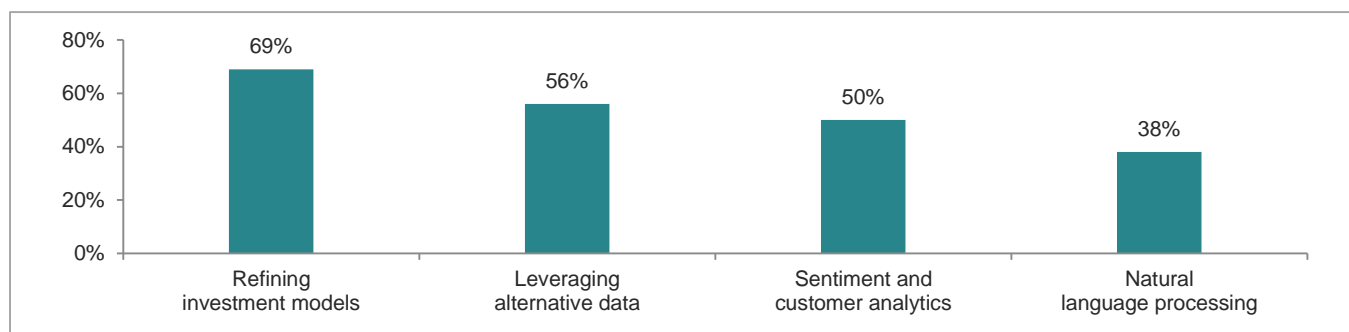Source: CRISIL Global Research & Analytics

Big data analytics is rapidly evolving

Big data analytics is rapidly evolving beyond static quant models and is now able to better respond to changes in the market and macro environment. Tech savvy funds are creating trading algorithms that make predictions based on historical data and sophisticated statistical probabilities. Firms are looking at enhancing their investment models by leveraging big data and new inputs. For example, Singapore GIC has recruited a Chief Data Scientist in its Data and Analytics Department to collect publicly available data and analyze it for patterns. GIC aims to increase the proportion of systematic investing using quant models and big data inputs to these models[2]. These rapid strides in big data analytics have been facilitated by declining technological costs, more accessible machine learning capabilities and an improvement in analytics talent pool.

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[1] Source: http://www.ft.com/cms/s/0/a4912008-bde8-11e5-846f-79b0e3d20eaf.html?ft_site=falcon&desktop=true#axzz4cDti2NmQ
[2] Source: https://www.bloomberg.com/news/articles/2016-11-27/singapore-s-gic-hires-big-data-expert-in-quant-strategy-push
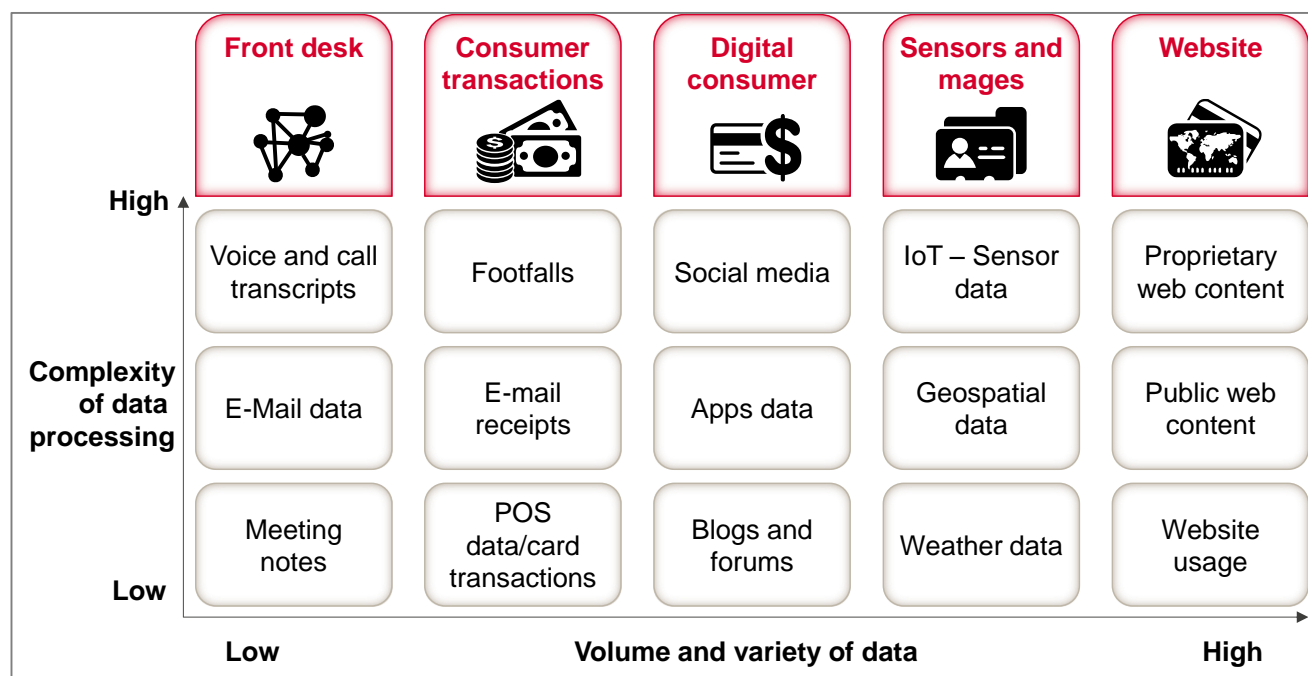
Asset manager priorities in big data analytics

Source: CRISIL Global Research & Analytics; the above are not mutually exclusive

Asset managers exploring alternative data in search for alpha

Asset managers are increasingly tapping into alternative data to generate alpha. They are combining alternatives such as transaction data, satellite imagery, weather pattern data, package delivery data and social media with the traditional data sets to provide their models with additional input factors that could help influence alpha generation. Such a trend can be primarily attributed to the growth of the Internet, the advance of social media and the emergence of the internet of things that provides sensory readouts.

New sources of big data

Source: CRISIL Global Research & Analytics

Alternative data sources are also rapidly expanding (please see Figure 4). We have categorized the various available sources of big data – both internal and external – by volume and variety of data (from low to high) and the complexity of data processing, reflecting the two major pain factors determining adoption. There are a multitude of sources available today which can be systematically harnessed by asset managers to derive additional insights and support various activities in research, investment, sales and marketing, and compliance.

For instance, SpaceKnow, a US company, has launched a dedicated China Satellite Manufacturing Index, which uses 2.2 billion satellite observations taken of over 500,000 sq km and 6,000 industrial facilities across China to arrive at an index of manufacturing activity[3]. It has been suggested that such data could ultimately be a useful indicator of economic activity. Dataminr, which applies analytics on Twitter data, had revealed preliminary reports of Volkswagen's emissions scandal three days before the market reacted[4]. Third-party firms such as Four Square, Placemeter, Earnest and Second Measure, collect location and footfall data and credit card transactions data.

A few data providers have even decided to enter the investment business themselves after seeing the sustainable advantages from such alternated data points. For instance, CargoMetrics, which provides information on global trade using satellite images and shipping data, has launched a hedge fund[5].
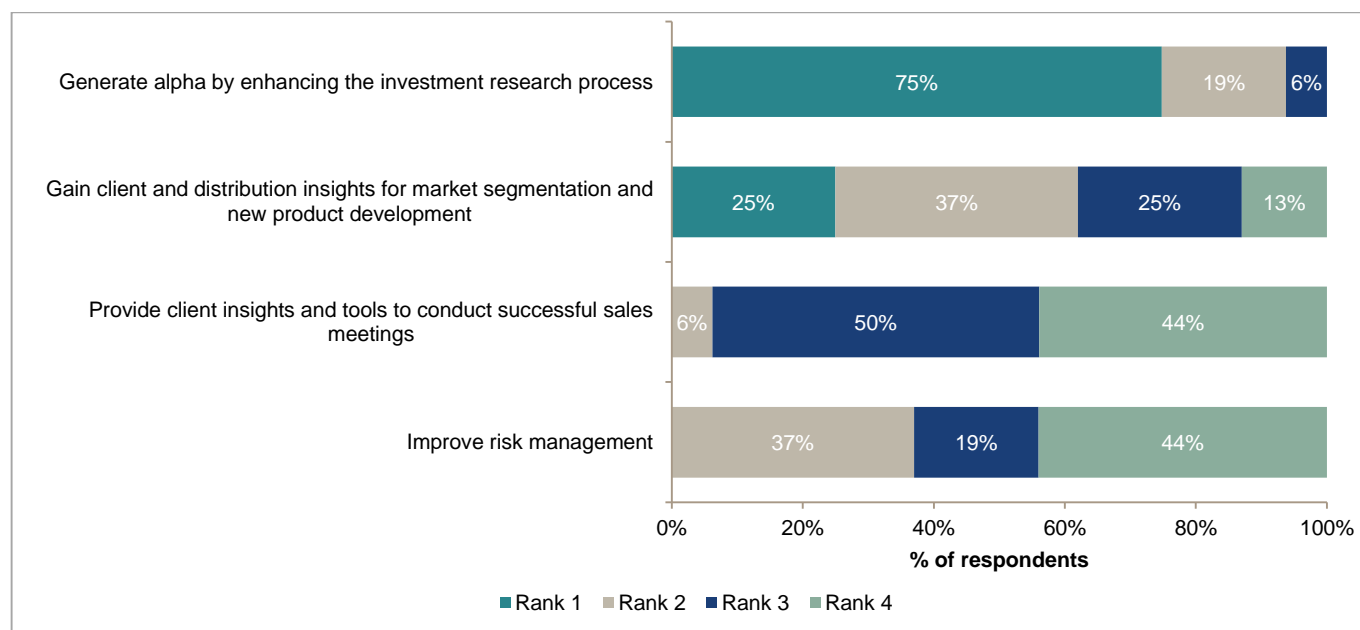
Lastly, some asset managers, who do not want to be concerned with plausible non-exclusivity and licensing issues, or due-diligence and quality related challenges, are investing and developing in-house proprietary data sources.

Big data applications beyond investment management

Asset managers are exploring applications for big data analytics that go beyond investment management. Sales and marketing teams are looking to examine investor and distribution information to improve customer acquisition, retention and conversion; reduce redemptions; and improve capital raising. Compliance teams are beginning to invest in big data and analytics in areas such as anti-money laundering, fraud management, and insider trading. Risk teams are looking at conducting a more robust scenario analysis than traditional VaR analysis.

In our survey, the respondents were asked to rank the objectives for investing in big data analytics. Over 75% of the respondents ranked alpha generation as the main objective for investing in big data analytics, while 25% chose market segmentation and new product development as the highest priorities.

Objectives of investing in big data analytics

Source: CRISIL Global Research & Analytics

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[3] Source: https://www.ft.com/content/f62ee814-f510-11e5-803c-d27c7117d132
[4] Source: http://fortune.com/2015/12/07/dataminr-hedge-funds-twitter-data/
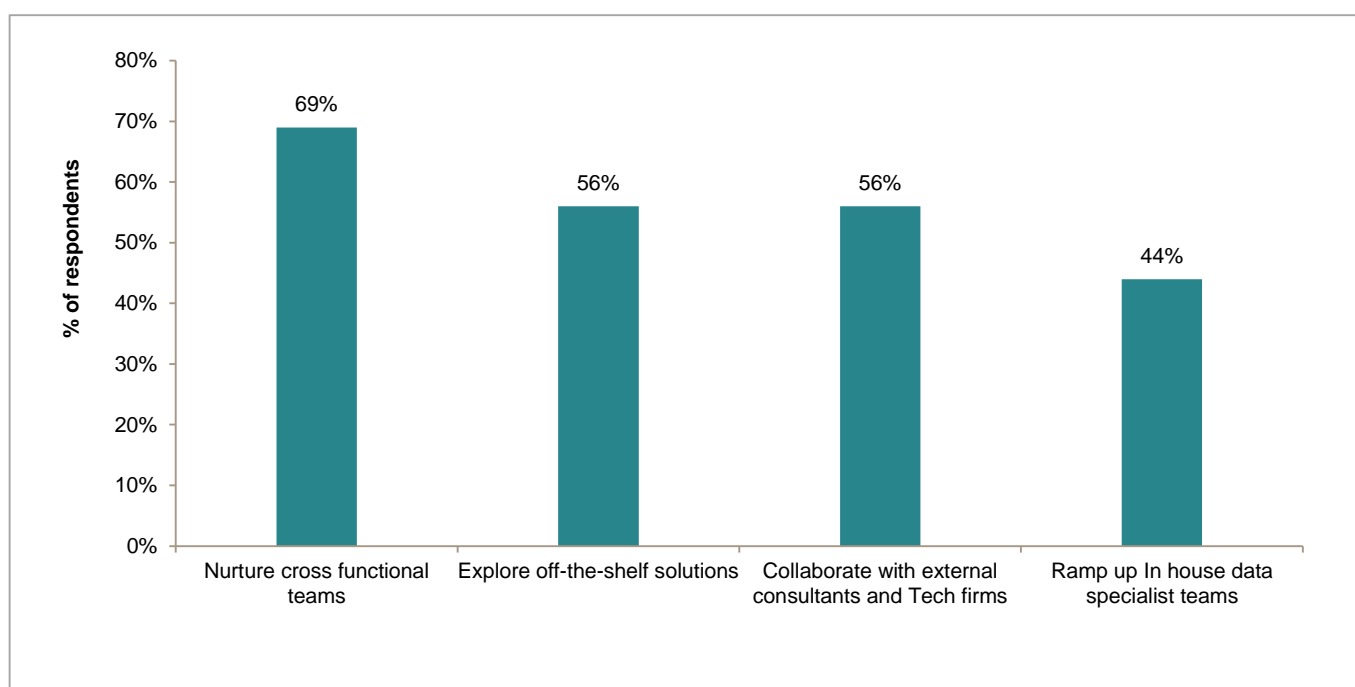[5] Source: https://www.ft.com/content/f62ee814-f510-11e5-803c-d27c7117d132

Partners to drive big data adoption

Although asset managers broadly believe that big data analytics have much promise, asset managers are wary of the substantial investments required in technology and people. For example, data sourcing experts, linguists, domain experts, and data scientists will be required to support portfolio managers and analysts. To minimize investments, asset managers are increasingly tapping into external consultants and niche service providers like CRISIL to execute pilot projects/ use cases without investing in full-scale infrastructure and additional staff. Some asset managers are looking at using data from external vendors that can be incorporated into traditional approaches or models.

Asset managers are typically looking to implement big data using a multi-pronged approach. According to our survey, about 70% of the firms plan to build cross-functional teams with a mix of internal and external people and consisting of quants, data scientists and fundamental analysts. Also, just under 60% of firms plan to collaborate with external vendors to execute proof of concepts and pilot use case projects.

In-house implementation through teams and partners ranked high by asset managers

Source: CRISIL Global Research & Analytics; The above are not mutually exclusive
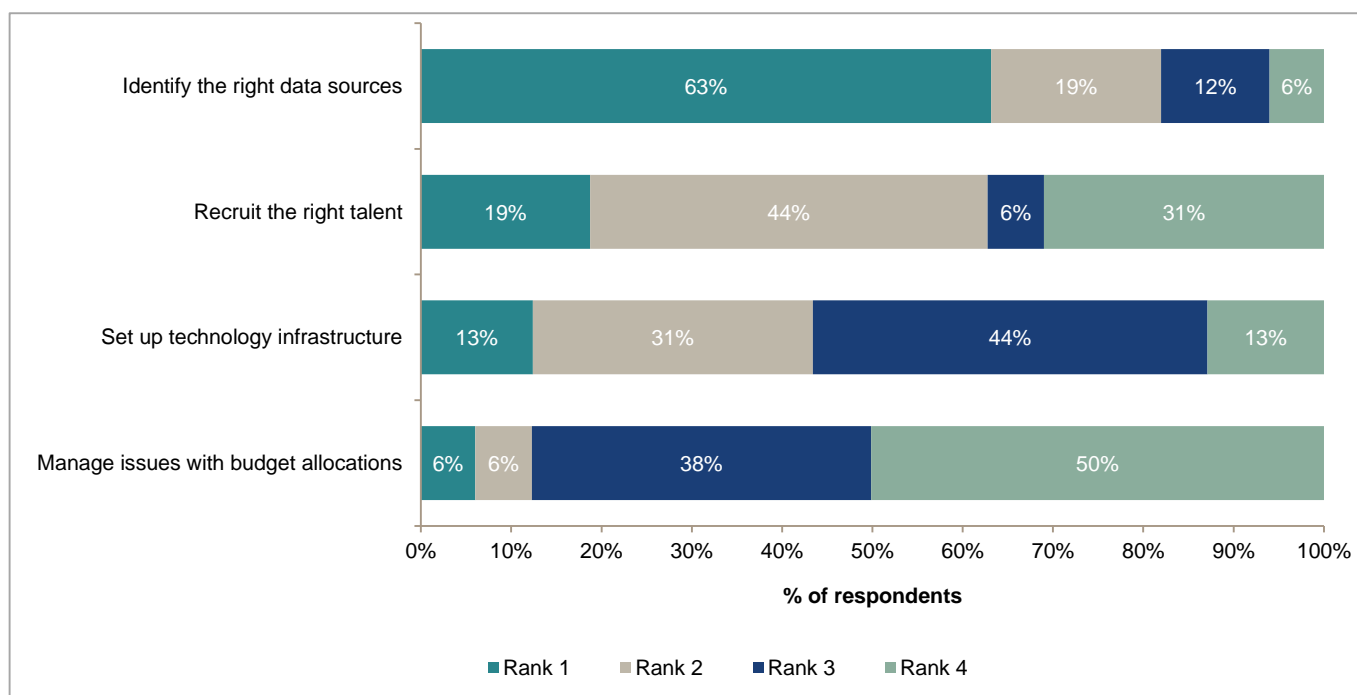
Key challenges to big data strategy of asset managers

Securing access to reliable, potent, and unique big data

To generate differentiated insights, asset managers are competing aggressively to secure access to unique big data sources. Some asset managers are also investing in capabilities with the 'secret sauce' such that they are able to source unique data and build databases for proprietary use. Given the diverse data sources, asset managers must test and validate the sources. Asset managers should also perform due diligence on data vendors and their sourcing methodologies and ensure that there are no legal or privacy issues. Notably, cleaning, validating and transforming raw data could take up to 80% of the effort in bringing the data into the investment research process.

In our survey, identifying the right data sources was ranked as the biggest challenge by more than half of the respondents and among the top two challenges by about three-fourth of the respondents.

Top challenges related to big data analytics

Source: CRISIL Global Research & Analytics

Ensuring big data-driven models are periodically reviewed and refined

Big data-driven models and strategies are likely to lose their edge over time as competitors ape successful strategies and the decay effect of signals start to kick in. Regulatory changes and shifts in macro and market factors such as volatility can also contribute to the failure of signals and strategies. Asset managers should periodically validate their models and strategies as the underlying regulatory and market environment changes. Asset managers may also end up using too many factors and over-fitting models and hence teams - internal and external - must be trained in basic statistics to understand big data analytics and insights better.

Implementing big data strategies prudently

Given the substantial investment required, we believe that most asset managers will incrementally implement big data analytics through pilot projects executed either internally or through external consultants and niche players/partners until the benefits and approach are established. This is also because there are a number of ideas, sources and use cases available to test, and asset managers have difficulty choosing where to spend their time, money or effort.
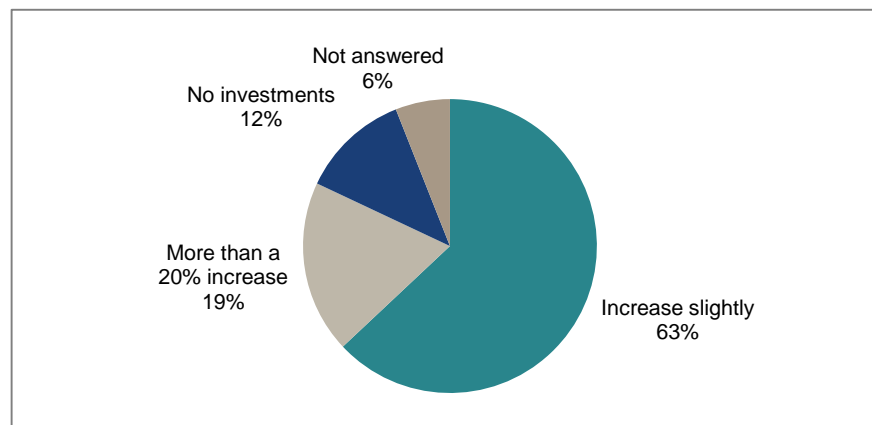
A senior quantitative leader and industry practitioner, who was the guest speaker at our discussion forum, laid out a robust framework on how asset managers could develop their big data and big data analytics strategy over two phases. According to him, in phase one (12-24 months), an analyst-driven project model that leverages external consultants and niche service providers, and existing infrastructure and technology is the best approach to understand the relevance, gauge the impact and estimate the ROI. Here, projects could address specific business challenges. In phase two (beyond 24 months), he recommends a more centralized, specialized skill-based approach, leveraging new-age technologies and capabilities such as machine learning and artificial intelligence.

Looking into the crystal ball

Asset managers to increase investments in big data

Asset managers are likely to significantly increase investments in big data to generate alpha. Over 80% of the respondents expect investments in big data analytics to 'increase slightly' or 'increase by more than 20%' in 2017.

Big data spending change in 2017 versus 2016

Source: CRISIL Global Research & Analytics.

Big data analytics to become an integral component of investment research process

Both access to unique sources of data and machine learning/deep learning algorithms would influence alpha generation. Asset managers would develop front-end analytics and visualization to make it easy for portfolio managers and analysts to consume and monitor big data insights. While big data will influence investment decision making, we believe the effect will be more pronounced in sectors such as consumers and financials, given the availability of rich data sources. Analysts and portfolio managers tracking these sectors will have to constantly look at new sources of information advantage and exploit signals and models based on alternative data.

Big data-driven factor-based funds (such as smart beta) to see increasing demand

We believe smart beta and similar passive/ pseudo-passive products are likely to gain market share and put pressure on asset managers to deliver more returns than those that can be delivered by traditional factors. Big data deployment is likely to help generate sophisticated and new factors beyond traditional ones such as value, momentum, and size.

Early adopters to have an edge

Early adopters have a head start in developing in-house capabilities in model development, implementation and validation. Further, they are also in a better position to secure access to and tap alternative data sources, either through in-house investments for generating proprietary inputs or through external vendors. To compete with early adopters, late adopters are likely to assemble off-the-shelf components and build services for end users with proven resources, but run the risk of being reactive and losing some competitive advantage.

Collaboration with tech firms, third parties, universities to increase

As asset managers look at firm-wise adoption of big data, we see increasing collaboration in big data between asset managers and technology firms, external consultants and niche players, and universities.

Big data is ultimately likely to affect alpha generation, product capabilities, and competitive positioning of asset management firms. In a few years from now, big data will be an integral part of the investment research process. Both traditional asset managers and hedge funds are likely to increase investments in the area, with use cases moving beyond investment research.

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