INTERNATIONAL INSTITUTE FOR ANALYTICS™

Analytics Maturity Powers Company Performance

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Introduction

Does the development of enterprise analytics capabilities really drive superior company performance?

As the International Institute for Analytics (IIA) works with clients from around the world, we are often asked this question. Of course, IIA strongly believes that it does. This very premise is at the center of our founding and our mission. *But is this belief supported by actual data*? The fact that we believe analytics drive performance isn't enough. The claim must be validated with real data and analytics that support the claim. This paper provides a range of such supporting evidence.

Our research on analytics maturity offers us a unique opportunity to explore this relationship and provide an up-to-date and unique perspective on previously published works. A summary of IIA's maturity methodology, which underpins this study, can be found in Section 1 of this report. For the purposes of this study, the term "analytics" can be broadly interpreted to include anything from classic descriptive reporting, to predictive modeling, to machine learning, to artificial intelligence. Companies rated higher in sophistication typically do more on the complex end of the spectrum, but everyone still does a lot of basic analytics as well. IIA's maturity model accounts for the breadth, depth, and sophistication of the analytics utilized within an organization.

In June 2016, IIA released *Ranking Analytics Maturity by Industry,* a market study covering 50 acknowledged industry leaders across twelve (12) different industry segments using IIA's proprietary Analytics Maturity Assessment (AMA) model. The goal of this study was to rank the industry segments, and to identify key characteristics and differences in enterprise analytics capabilities across segments. The complete results as well as the methodology can be viewed in the original study. Two follow up reports, *Driving Corporate Performance in Retail Through Analytics* (January 2017) and *Driving Clinical and Operational Performance Through Analytics* (August 2017), added an additional 35 retailers and healthcare providers to our database of market- leading companies.

Although these market studies were not originally designed to answer the above question, a review of the data and the quality of the companies included, motivated us to re-examine the data to explore the potential relationship between analytics maturity and company performance. A few of the most important findings are:

- High analytics maturity is positively associated with superior market valuations, shareholder returns, financial performance, and company performance (See Table 2 – see Addendum).

- As would be expected, but has now been further validated by this study, companies in Stage 4 of analytics maturity (using a 5-stage maturity model) achieve higher levels of performance than companies in the second or third stage of analytics maturity. Companies in Stage 3 of analytics maturity achieve higher performance than companies in the second stage of analytics maturity (See Table 3 – see Addendum).

- Companies with high levels of analytics maturity are more likely to be included in and rank higher in "Top Company" lists from *Fortune (Most Admired)*, *Forbes (Most Powerful Brands, Most Innovative), Brand Finance (Top 500 Most Valuable Brands)* and *Boston Consulting Group (Most Innovative).* This indicates a strong positive association between a company's analytics maturity and its reputation, its strength of brand, and its ability to innovate (See Table 2).

Previous Perspectives on Analytics Capability and Company Performance

In *Competing on Analytics*, *Analytics at Work*, and numerous other books, the relationship between enterprise analytics capabilities (or maturity) and improved decision making, competitive advantage, and ultimately company performance is strongly implied. In *Competing on Analytics*, Tom Davenport and Jeanne Harris cite several studies showing a "significant correlation between higher levels of analytical maturity and robust five-year compound annual revenue rates" and that "high performers (in terms of profit, shareholder return, and revenue growth) were 50 percent more likely to use analytics strategically compared to the overall sample and five times as likely as low performers."[1]

In *Big Data: The Management Revolution*, Andrew McAfee and Erik Brynjolfsson conducted structured interviews with executives at 330 public North American companies and examined the link to company performance. They concluded that "the more companies characterized themselves as data-driven, the better they performed on objective measures of financial and operational results. In particular, companies in the top third of their industry in the use of data-driven decision making were, on average, 5 percent more productive and 6 percent more profitable than their competitors. This performance difference remained robust after accounting for the contributions of labor, capital, purchased services, and traditional IT investment. It was statistically significant and economically important and was reflected in measurable increases in stock market valuations."[2]

In *The Digital Advantage: How Digital Leaders Outperform Their Peers in Every Industry*, CapGemini Consulting and MIT Sloan explore the relationship between Digital Maturity and company performance. In this study, Digital Maturity encompasses a company's ability to leverage technologies like social media, mobile, analytics, and embedded devices to change their customer engagement, internal operations, and even their business models. While this is only a subset of the overall enterprise analytics capabilities measured by IIA, it provides a useful and valuable comparison. In this analysis of over 400 companies, companies that demonstrated the highest levels of Digital Maturity demonstrated higher revenue generation (+12%), profitability (+26%) and higher market value (+12%).[3]

In *The Value of Big Data: How Analytics Differentiates Winners*, Bain Consulting surveyed over 400 companies from around the world on their data and analytics capabilities. Bain found that "only 4 percent of the companies were really good at analytics" and these companies were "twice as likley to be in the top quartile of finanacial performance within their industries."[4]

A company's ability to leverage analytics and data to create new markets or transform existing markets is also driving increased venture capital activity. As noted by KMPG / CB Insights in its Q4 2015 Venture Pulse report, "2015 was a record setting year. Over $128B of investment was made in 2015…(this investment) reflects an understanding among investors that the very foundation of how business is conducted is changing – and it's changing more rapidly than almost anyone could have imagined. Banking. Healthcare. Education. Insurance. Travel. Every sector is ripe for transformation, ripe for new business models to supersede the models that have come before."[5]

This unprecented rising tide of opportunity is being reflected in larger investment rounds and higher valuations. Both Fortune and TechCrunch actively track start-up "Unicorns," companies with valuations of greater than $1B based on their most recent round of financing, and most of these 160+ companies either heavily leverage analytics in their business models (e.g., Uber, Airbnb, Lyft) or provide critical big data and analytics infrastructure (e.g., Palantir, Domo, Mu Sigma).

[1] Davenport, Tom and Harris, Jeanne. *Competing on Analytics*. 2007.
[2] McAfee, Andrew and Brynjolfsson, Erik. (2012, October). *Big Data: The Management Revolution*. Retrieved from: https://hbr.org/2012/10/big-data-the-management-revolution.
[3] Capgemini and MIT Centre for Digital Business. (2012, November). *The Digital Advantage: How Digital Leaders Outperform their Peers in Every Industry*. Retrieved from: https://www.capgemini.com/gb-en/resources/the-digital-advantage-how-digital-leaders-outperform-their-peers-in-every-industry/.

[4] Wegener, Rasmus and Sinha, Velu. (2013, September). *The Value of Big Data: How Analytics Differentiates Winners*. Retrieved from: http://www.bain.com/publications/articles/the-value-of-big-data.aspx.
[5] KPMG and CB Insights. (2016, January). *Venture Pulse Q4 2015*. Retrieved from: https://assets.kpmg.com/content/dam/kpmg/pdf/2016/01/venture-pulse-q4-report.pdf.

Section 1:

The Methodology: Measuring Analytics Capabilities And Maturity

Examining the link between analytics and company performance brings up a key question: *How do you measure and quantifiy analytics capabilities?*

IIA believes that enterprises are moving into an era where they need to better quantify the relationship between investment in big data and analytics, including AI, and actual organizational and business impact. Measurements of analytics capabilities need to be reliable and repeatable while accounting for dramatic and fast-changing technologies and marketplaces.

There are several traditional approaches for measuring analytics capabilities including self assessment, qualitative interviews, and quantitative surveys. These traditional approaches have potential weaknesses, particularly around what we call "depth and breadth" of analytics capabilities.

For example, self assessments and quantitative surveys tend to be checklist driven. They capture whether or not a particular tool or technology has been installed, but they fail to identify if an organization is fully using the technology to drive business decisions, realize business impact, and achieve competitive advantage. Qualitative interviews with executives can suffer from being anecdotal and selective in their coverage. Our experience in doing full assessments with clients, involving up to 2,000 survey participants, often reveals dramatic differences in analytics maturity between different groups and employee grade levels within an organization.

To address these issues, IIA has adopted a new methodology for its Analytics Maturity Assessment (AMA). Our approach combines broadly deployed quantitative surveys, organizational modeling, and a software-driven maturity scoring model. As a result, IIA provides measures of an organization's analytics capabilities, its analytics culture and its ability to put analytics into practice while also providing actionable information for driving analytics initiatives.

The AMA's scoring model is based on the DELTA framework (Figure 1), developed in 2010 by Tom Davenport, Jeanne Harris, and Bob Morison in their book, *Analytics at Work: Smarter Decisions, Better Results,* and Five Stages of Analytics Maturity (Figure 2), developed in 2007 by Tom Davenport and Jeanne Harris in their book, *Competing on Analytics.* We have over three years of experience using this tool to assess enterprise analytics maturity. A full AMA can involve up to 2,000 survey respondents across the entire organization and evaluates up to 33 unique competencies. DELTA scores are calculated on a 1.00-5.99 scale with descriptive stages of maturity assigned to each of the five score ranges (1-1.99, 2-2.99, etc.).

For the analytics maturity research, we refactored the AMA model to evaluate the 17 competencies that proved to be the largest drivers of analytics maturity based on our experience performing full AMAs. Survey responses from our target companies were collected and processed using our refactored AMA to calculate the company's analytics maturity score. For companies to be included in the study, we required a minimum of five total survey respondents and representation from at least three core analytics-focused departments (analytics / IT, finance, and sales / marketing) from each company. Respondents can come from outside the core departments once the core departments are represented. Data was collected from 515 respondents across 74 companies. The average number of survey respondents per company was seven with a minimum of five respondents and a maximum of 12 per company.

△ DELTA = CHANGE

D	DATA	BREADTH, INTEGRATION, QUALITY
E	ENTERPRISE	APPROACH TO MANAGING ANALYTICS
L	LEADERSHIP	PASSION AND COMMITMENT
T	TARGETS	FIRST DEEP THEN BROAD
A	ANALYSTS	PROFESSIONALS AND AMATEURS

Originally published in *Analytics at Work*, Davenport, Harris & Morison
Figure 1: DELTA Model

STAGE 5: ANALYTICAL COMPETITORS:
"Analytical Nirvana." Use analytics across the enterprise as a competitive differentiator and in strategy.

STAGE 4: ANALYTICAL COMPANIES:
"Good at Analytics." Highly data oriented, have analytical tools, and make wide use of analytics. Lack commitment to fully compete or use strategically.

STAGE 3: ANALYTICAL ASPIRATIONS:
"See the value of analytics." Struggle to mobilize the organization and become more analytical.

STAGE 2: LOCALIZED ANALYTICS:
"Use reporting." Use of analytics or reporting is in functional or business silos.

STAGE 1: ANALYTICAL IMPAIRED:
"Not data-driven." Rely on gut feel and plan to keep doing so. Not asking analytics questions and/or lack the data to answer them.

Adapted from *Competing on Analytics*
Davenport and Harris, 2007

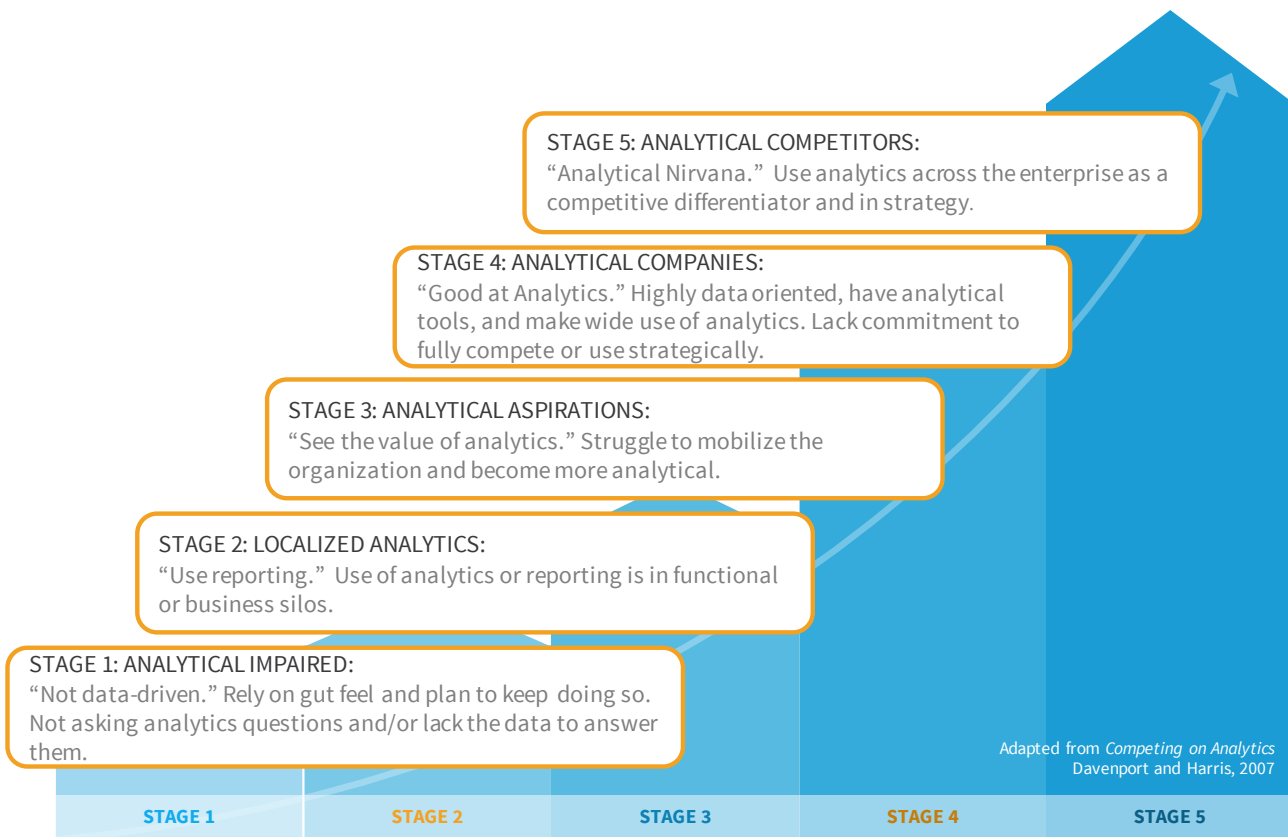| STAGE 1 | STAGE 2 | STAGE 3 | STAGE 4 | STAGE 5 |

Figure 2: Five Stages of Analytics Maturity as originally published in *Competing on Analytics* (Davenport & Harris)

Section 2:
The Methodology: Companies and Metrics Included

IIA's analytics maturity research is designed to examine industry leaders in terms of size, brand, innovation, and analytics capabilities. As a result, the information and conclusions provided in this study indicate how the leaders from different industries compare. Criteria for inclusion in IIA market studies was determined from the feedback of IIA's clients, faculty, and expert network and from respondents meeting the minimum participation requirements for the study as outlined in Section 1. The detailed list of included companies is provided in Infographic 1.

The list of companies spans the spectrum of the U.S. economy. The oldest company on the list (JP Morgan Chase) can trace its founding to 1799. The youngest company (Facebook) was founded in 2004.

The Digital Native group consists of six companies. Google, Amazon, Netflix, eBay, and Facebook are obvious Digital Native companies given their founding dates and business models. IIA has also included Apple in this group due to its high score, its leadership position in the digital economy, and because the majority of its revenues and profits (85%+) are derived from products and services launched since 2007 (iPhone). Apple's inclusion in this group, despite being founded in 1976, validates that traditional companies, even those not competitive in their current industry, can adapt and transform to compete against the highest performers.

The industry segments were defined by IIA to examine specific markets (Healthcare, Financial Services, Retail) with high levels of analytics or target customers that drive high analytics usage (Consumer Brands, Manufacturing, Digital Native).

For comparison purposes, the table also includes Market Capitalization (on 6/30/17), Forward P/E (on 6/30/17), and each company's position in the most recent Fortune 1000, Fortune Most Admired Companies and Forbes Most Innovative Companies. In addition, the brand value as calculated by Brand Finance and the number of times a company has appeared on BCG's Most Innovative Companies list are also provided.

Infographic 1: This study looked at 74 companies across a variety of different industry segments.

Section 3:
The Results: Measuring Enterprise Analytics Maturity and its Impact on Company Performance

Of the 74 companies we analyzed for this research brief, 64 are publicly traded. To explore a possible link between a company's analytics maturity and its financial performance, IIA used publicly available financial performance data for these 64 companies. When looking at non-financial performance related links, such as inclusion and rank in "Top Company" lists, IIA used all 74 companies.

To examine these relationships, we used comparisons of average scores across company groupings, average performance metrics across maturity stage, scatter plot analysis, and correlation coefficients.

When using correlation coefficients, IIA calculated the correlation coefficient between a company's overall maturity score (DELTA score) and the associated metric. Given the sample sizes, we also examined the statistical significance of relationship where applicable. In total, 72 comparisons were made across a variety of investment return, financial performance and company performance metrics outlined in Table 1. A summary of all of the comparisons and the associated data is provided in Table 2 and Table 3 (see Addendum).

The following pages examine the results found for each type of metric.

Investment Return	Financial Performance	Company Performance
• Market Capitalization ($Billions) • Forward Price to Earnings Ratio (Forward P/E Ratio) • 5-Year Shareholder Return • 5-Year Shareholder Return vs S&P Segment • 10-Year Shareholder Return • 10-Year Shareholder Return vs S&P Segment • Return on Equity	• 3-Year Revenue Growth • 5-Year Revenue Growth • 10-Year Revenue Growth • 5-Year Operating Income Growth • 10-Year Operating Income Growth • Return on Assets	• Brand Value – Top 500 Brands ($Billions) • Change in Brand Value (1-year and 2-year) • Fortune Most Admired Companies Rank • Fortune Most Admired Companies Score • Forbes Most Powerful Brands Rank • Forbes Most Innovative Companies Rank • BCG Most Innovative Companies Rank • BCG Most Innovative Companies Frequency

Table 1: A summary of the Investment Return, Financial Performance and Company Performance metrics used for this study.

Metric: Market Capitalization

Market capitalization was chosen as a metric of overall enterprise value. To examine the relationship between market capitalization and analytics maturity, we looked at average comparisons, stage comparisons, correlation coefficients, and scatter plots. This analysis assumes that the relationship between analytics maturity and market capitalization is approximately linear in nature.

- *Average Comparison* – In performing our average comparison, we grouped the companies into three market capitalization ranges: < $50B, $50B - $250B, and > $250B. In comparisons with the Digital Native group, companies with market capitalization greater than $250B had higher analytics maturity scores than companies with market capitalization below $250B. In comparisons without the Digital Native group, companies between $50B and $250B in market capitalization had the highest scores (see Table 2).

- *Stage Comparison* – The average market capitalization of Stage 4 companies in our study was $271B versus an average market capitalization of $96B for Stage 3 companies and $39B for Stage 2 companies. When the Digital Native group was removed from Stage 4, the average market capitalization was $116B (see Table 3).

- *Correlation Coefficient* - The correlation between the DELTA score and market capitalization was one of the strongest we measured, with a correlation coefficient of .45 (P <.01) with the Digital Native group included and .31 (P < .05) without the Digital Native group. Using this metric, high analytics maturity is associated with high market capitalization, although the direction of the relationship is unknown.

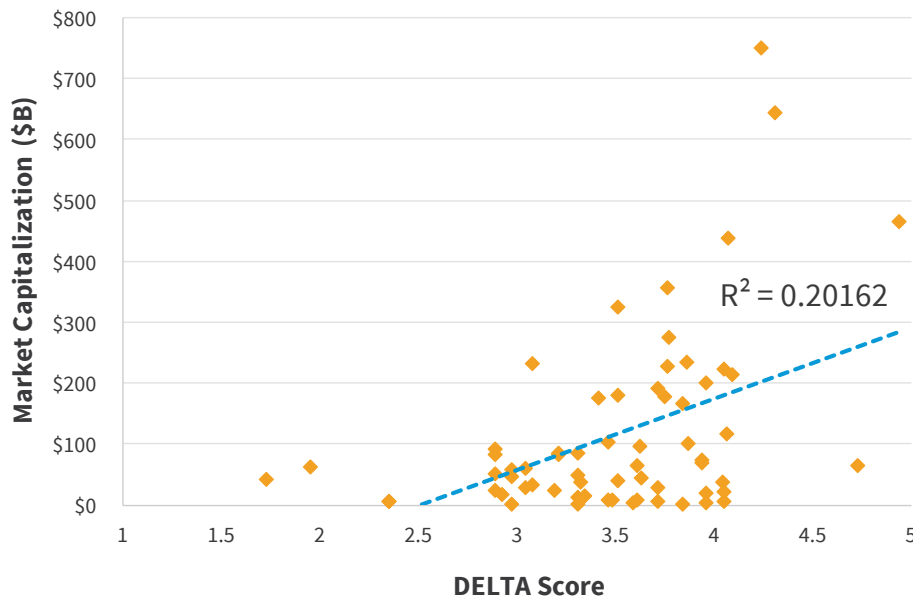### Market Capitalization vs. DELTA

$R^2 = 0.20162$

Chart 1: A scatter plot analysis comparing Market Capitalization to the DELTA Score. The Market Capitalization values were based on prices from 6/30/17.

Conclusion
Companies with higher analytics maturity are more likely to have a higher market capitalization.

Metric: Forward Price to Earnings Ratio

One might question – *Does analytics maturity really drive higher enterprise value or do large market capitalization companies simply have the resources to invest in analytics maturity?*

Forward price-to-earnings ratio (forward P/E ratio) was selected as an indicator of the market's perception of enterprise value in terms of earning quality and expected growth rate. This is an interesting metric because it is somewhat decoupled from market capitalization, especially in extreme large cap companies like Apple and Google where there is investor resistance to continued increases in value since almost everyone owns the stock. For this analysis, we assumed that the relationship between analytics maturity and forward P/E was also linear.

- *Stage Comparison* – The average forward P/E ratio of Stage 4 companies in our study was 54.9 versus an average forward P/E ratio of 18.2 for Stage 3 companies and 12.3 for Stage 2 companies. When the Digital Native group was removed from Stage 4, the average forward P/E was 20.1.

- *Correlation Coefficient* - The correlation between the DELTA score and Forward P/E was .47 (P < .01) with Digital Natives and .27 (P < .05) without Digital Natives included.

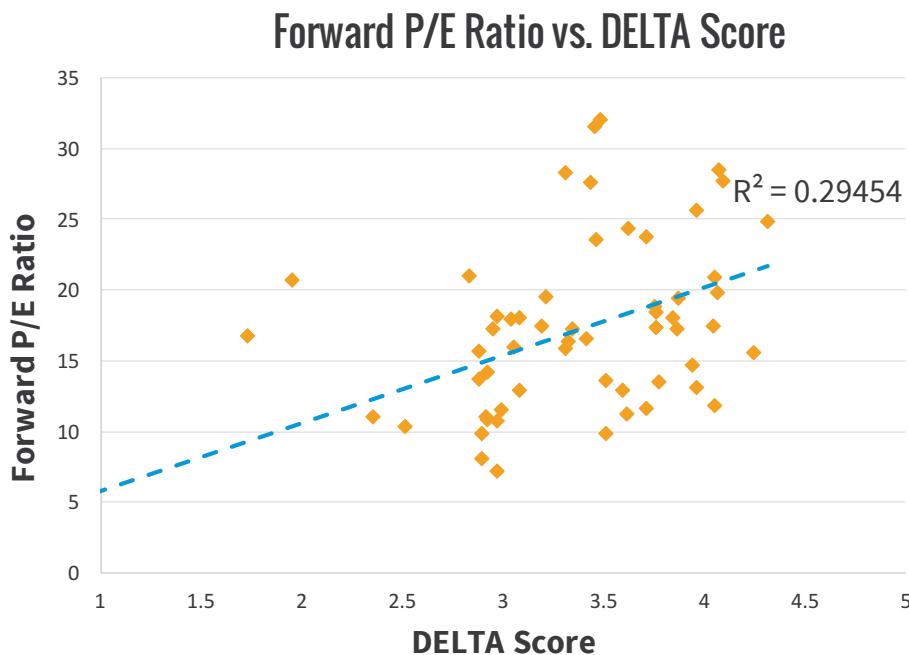## Forward P/E Ratio vs. DELTA Score

$R^2 = 0.29454$

Chart 2: A scatter plot analysis comparing Forward Price to Earnings ratio to DELTA Score with two highest and two lowest scores trimmed. The Forward P/E ratios were based on prices from 6/30/17.

Conclusion

Companies with higher analytics maturity are more likely to have a higher forward P/E ratio, which means that investors value these companies more.

Metrics: 5-Year and 10-Year Shareholder Return

To explore the relationship between analytics maturity and shareholder return, we looked at both the absolute 5-year and 10-year shareholder return and the relative (in comparison to a company's S&P industry segment) 5-year and 10-year investor return.

There was a slight, positive association between analytics maturity and absolute (.12) and relative 5-year shareholder (.06) return when looking across all companies. However, when looking at 10-year shareholder return, there is a positive correlation with both absolute and relative return, at .46 (P < .01) and .41 (P < .01) respectively. This positive association held true when the Digital Native group was removed with absolute and relative return at .18 and .21 respectively, but it was not as statistically significant.

When looking at the average 5-year and 10-year return of Stage 4 companies versus Stage 3 and Stage 2 companies, the Stage 4 companies significantly out-performed (2X to 3X better) the Stage 3 and Stage 2 companies. When the Digital Native group was removed, the results were less conclusive. However, Stage 4 and Stage 3 companies significantly out-performed the Stage 2 companies. The summary of these results is provided in Chart 3.

5-Year and 10-Year Investment Return by DELTA Stage

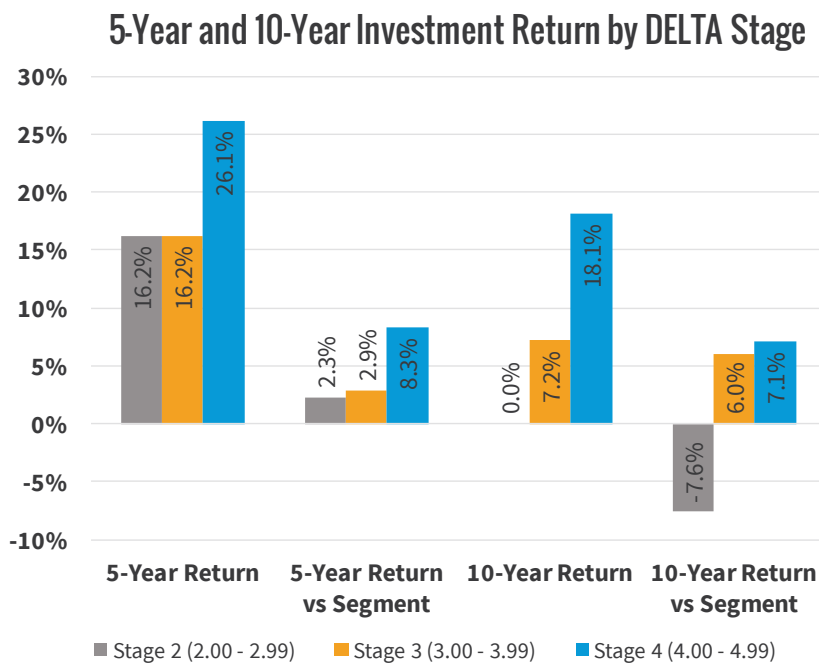Stage 2 (2.00 - 2.99) Stage 3 (3.00 - 3.99) Stage 4 (4.00 - 4.99)

Chart 3: 5-year and 10-year return by DELTA stage. The 5-year and 10-year returns are calculated as of 6/30/17 and based on quarterly changes in stock price. (Source: Morningstar)

Conclusion
Companies with high analytics maturity are more likely to generate higher shareholder returns.

Metric: 5-Year and 10-Year Revenue Growth and Operating Income Growth

When looking at 5-year revenue growth and operating income growth, there is a positive correlation between them at .26 ($P < .05$) and .26 ($P < .05$) respectively. If the Digital Native group is removed, there is no association between revenue and operating income growth and the DELTA scores.

When looking at 10-year revenue growth and operating income growth, there is a positive correlation between them at .43 ($P < .01$) and .42 respectfully ($P < .01$). If the Digital Native group is removed, there is a positive correlation of .09 with revenue growth and .29 ($P < .05$) with operating income growth.

Stage 4 companies achieved significantly higher (3X better) levels of revenue growth and operating income growth than Stage 3 and Stage 2 companies. When removing the Digital Native group from Stage 4, the results were less conclusive, except for 10-year revenue growth and 10-year income growth where Stage 4 companies performed better than Stage 3 and Stage 2 companies. The summary of these results is provided in Chart 4.

Revenue and Operating Income Growth by DELTA Stage

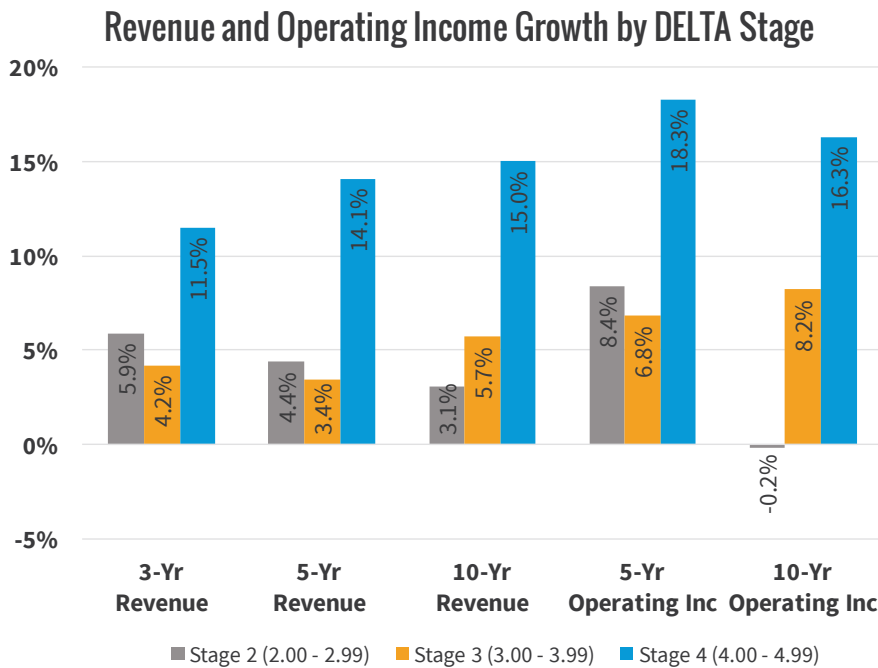|	Stage 2 (2.00 - 2.99)	Stage 3 (3.00 - 3.99)	Stage 4 (4.00 - 4.99)
3-Yr Revenue	5.9%	4.2%	11.5%
5-Yr Revenue	4.4%	3.4%	14.1%
10-Yr Revenue	3.1%	5.7%	15.0%
5-Yr Operating Inc	8.4%	6.8%	18.3%
10-Yr Operating Inc	-0.2%	8.2%	16.3%

Chart 4: 5-year and 10-year Revenue and Operating Income Growth by DELTA stage. The 5-year and 10-year growth rates are calculated as of 6/30/17 and based on quarterly reporting. (Source: Morningstar)

Conclusion
Companies with high analytics maturity are more likely to generate higher revenue and operating income growth.

Metric: Return on Equity

Return on equity measures the rate of return achieved on the capital invested by common shareholders and retained by the company. It demonstrates a company's ability to generate profits from shareholders' equity. Return on Equity shows how well a company converts investment funds into growth.

When looking at 1-year and 5-year return on equity across all companies, there was a positive association between DELTA score and return. For 1-year return on equity the correlation was .13 and for 5-year return on equity it was .13. If the Digital Native group was removed, the 1-year return on equity correlation was .15 and for 5-year return on equity it was .15. While all positively associated, these did not have high statistical significance.

When looking at stage averages, Stage 4 companies achieved significantly higher (3X better) returns on equity (36.2%) versus Stage 3 (9.7%) and Stage 2 companies (11.2%). When the Digital Native group was removed from Stage 4 companies, the return on equity (65.6%) was even higher.

Conclusion
Companies with high analytics maturity are more likely to get a better return on equity.

Metric: Return on Assets

Return on Assets shows the rate of return being earned on all of the firm's assets regardless of how those assets were financed. It is a measure of how efficiently a company leverages all of its stakeholders' assets.

When looking at 1-year and 5-year return on assets, there was a positive association between DELTA score and return. For 1-year return on assets the correlation was .27 ($P < .05$) and for 5-year return on assets it was .17. When the Digital Native group was removed, the 1-year return on assets correlation was .23 and for 5-year return on assets it was .15. While all positively associated, only the 1-year return was considered statistically significant ($P < .05$ or better).

In addition, Stage 4 companies achieved higher returns on assets (8.7%) versus Stage 3 (6.0%) and Stage 2 companies (5.0%). When the Digital Native group was removed from Stage 4 companies, the return on assets (8.0%) was still higher than Stage 3 and Stage 2 companies.

Conclusion
Companies with high analytics maturity are more likely to get a better return on equity.

Metric: Brand Value

Analytics play an increasing role in building company and product brands. Using Brand Finance's brand values, we looked at the correlation coefficient between a company's DELTA score and a company's rank on the Top 500 list, measured brand value, its one-year change in brand value (2016 to 2017), and its two-year change in brand value (2015 to 2017). This analysis was limited to the companies with publicly available brand values. In cases where companies had multiple brands on the list, we used their highest-valued brand.

The correlation coefficient for the brand rank on U.S. and global Top 500 Brands list was positive both with the Digital Native group included (.40 U.S. / .45 Global / $P < .01$) and without the Digital Native group included (.34 U.S. / .42 Global / $P < .01$). The correlation coefficient for brand value (in U.S. dollars) was positive with Digital Natives included at .40 ($P < .01$) and .13 without Digital Natives included. The correlation coefficient for a one-year change (.02) and for a two-year change (-.05) were essentially zero.

Conclusion
Companies with high analytics maturity are more likely to build brand value over time.

Metric: Company Age

Can only young, Digital Native companies excel at analytics?

While not directly related to company or financial performance, we felt this might provide additional and valuable context. To examine this relationship, we grouped the companies into three segments: 1) companies founded before the introduction of corporate computing (1950), 2) companies founded between 1950 and 1995, and 3) companies founded after 1995 (the widespread adoption of the internet).

We then averaged the DELTA scores of the companies in each segment. With the Digital Native group included, companies founded after 1995 had higher DELTA scores than the companies founded before. Without the inclusion of the Digital Native group, companies founded after 1995 and companies founded before 1950 had the same score (3.33) while companies founded between 1950 and 1995 had the lowest average score (3.10).

Conclusion
Companies of any age can develop analytics maturity.

Metric: "Top Company" Lists

Analytics are dramatically reshaping how companies develop, market, and sell products and services. In order to explore this link, we looked for objective proxies for company reputation, brand value, innovation, and competitiveness that might fall outside traditional financial or stock performance metrics. To meet this objective, we decided to leverage the popular "Top Company" lists as an indicator for company performance in these areas. We looked at relative position on lists, inclusion / exclusion on lists and scoring of our market study companies from the following popular performance lists:

1. *Fortune's Most Admired Companies*
2. *Brand Finance's Top 500 U.S. Brands*
3. *Forbes' Most Valuable Brands*
4. *Forbes' Most Innovative Companies*
5. *Boston Consulting Group's Most Innovative Companies of 2005 - 2016*

To examine the relationship between analytics maturity and these metrics we performed an average comparison, a stage comparison, and we calculated the correlation coefficients.

- *Average Comparison* - For this comparison, we calculated the average DELTA score of the companies that made each top company list against the average score of the companies that did not make each top company list. We also calculated the average DELTA score with and without the Digital Native group. In every case, the average DELTA scores of the companies that made each list were higher than the average DELTA scores of the companies that did not make the lists.

- *Stage Comparison* – For this analysis we used the overall score from *Fortune's Most Admired Companies* list. The overall company score is based on a number of performance metrics including innovation, people management, social responsibility, quality, and competitiveness. Stage 4 companies averaged 7.21 versus a Stage 3 average of 6.88 and a Stage 2 average of 6.25. When the Digital Native group was removed, the Stage 4 average was still higher at 7.01.

- *Correlation Coefficients* - For the companies that made each of the performance lists, the correlation coefficient between a company's DELTA score and a company's position on the most recent list was calculated. We also used the overall scores from *Fortune's Most Admired Companies* as a proxy for overall company performance and we calculated the correlation coefficient between a company's DELTA score and overall score. Finally, using BCG's historical data from 2005 to 2016, we looked at the relationship between analytics maturity and the number of times a company made the list over this period. In every case, the correlation coefficient was positive.

Conclusion
High levels of analytics maturity are positively associated with company reputation, with powerful brands, with innovation, and with overall company performance.

Section 5:
Conclusions

Can we conclude that the development of enterprise analytics capabilities is significantly associated with superior company performance?

From our perspective the answer is YES! The analysis outlined in this research brief provides additional support for the link between high levels of analytics maturity and superior company performance outlined in *Competing on Analytics* over 10 years ago. *Of the 72 different metrics examined in the study, 59 showed a positive association between analytics maturity and financial or company performance and 13 showed no or minimal association.*

Our determination of positive association across 59 metrics was based on higher average scores across groupings or correlation coefficients greater than .2. Our determination of no or minimal association was based on equivalent average scores or correlation coefficients between .20 and -.20. Due to our relatively small sample size, we ran statistical significance tests where applicable (on 32 of 72 metrics). Twenty of these 32 metrics (over 60%) had a statistical significance of P < .05 or better. Table 2 and Table 3 summarize the results of this analysis with the positive associations highlighted in blue as well as the statistical significance.

Yes, Analytics Maturity IS Associated With Company Performance!
Of the 72 different metrics examined in the study, 59 showed a positive association between analytics maturity and financial or company performance and 13 showed no or minimal association.

We believe this analysis builds on previous studies and lends critical supporting evidence that building strong enterprise analytics capabilities leads to more innovation, better brands, higher financial performance, and better shareholder returns. At the very least, the higher performing companies in this market study are investing their financial resources into analytics to extend their market-leading advantage. Given these promising results, IIA is collecting more data to expand the sample size and monitor changes in performance over time. We are also preparing follow up research.

Our current analysis leads us to the following conclusions:

- Enterprise analytics maturity is strongly associated with superior financial performance, increased shareholder value, and other metrics of high company performance. Analytics and business leaders seeking to energize organizations to pursue improved enterprise analytics capabilities should consider the potential positive impact on company performance and shareholder value in their evangelization of analytics.

- Since analytics maturity is associated with superior company performance and shareholder value, companies should continue to invest in the development of analytics capabilities to remain competitive.

- Building analytics capabilities and realizing value from the investment requires a strategic approach and a long-term perspective. There are no quick fixes. For example, the links between analytics capabilities and shareholder return, revenue growth, and net income growth appear when looking at longer time horizons (years versus the most recent quarter).

- Since analytics maturity is associated with superior company performance and shareholder value, companies should consider mechanisms for assessing their current state of analytics maturity and measuring the development of this strategic capability over time. The DELTA Model and the Five Stages of Analytics Maturity are robust frameworks for assessing analytics maturity and IIA's Analytics Maturity Assessment makes it possible to operationalize the use of these frameworks as part of a larger analytics strategy and program.

IIA is driving toward a future where company and industry analytics capabilities can be accurately quantified, compared, and used as a key performance metric for the entire enterprise. We believe that firms will use the evidence of their data and analytics acumen as a way to both plan investment and promote themselves in a manner similar to the way firms use JD Power or U.S. News rankings to communicate how analytics maturity drives company performance.

Addendum

Top Company Lists - Average DELTA

	Fortune Most Admired		Forbes Most Powerful Brands		Forbes Most Innovative	
	With Digital Native	Without Digital Native	With Digital Native	Without Digital Native	With Digital Native	Without Digital Native
On List	3.67	3.51	3.59	3.42	3.98	3.64
Not On List	3.20	3.18	3.20	3.20	3.31	3.26

Market Capitalization - Average DELTA

	With Digital Native	Without Digital Native
> $250B	3.49	3.23
$50B - $250B	3.44	3.40
< $50B	3.18	3.15

Year Founded - Average DELTA

	With Digital Native	Without Digital Native
>1995	3.66	3.33
1950 - 1995	3.24	3.10
< 1950	3.33	3.33

Current Valuation - 6/30/17

Market Capitalization***	0.45
Mkt Cap w/o Digital Native**	0.31
Forward P/E Ratio***	0.47
Forward P/E Ratio w/o DN**	0.27
R^2 Market Capitalization	0.2016
R^2 Forward P/E Ratio	0.096

Top Lists - DELTA and Ranking

Fortune Most Admired**	0.45
Fortune Most Admired Score*	0.28
Forbes Most Powerful Brands*	0.34
Brand Finance Valuable Brands	0.45
Forbes Most Innovative	0.31
BCG Most Innovative 2005-16***	0.57

Stock Performance

5 Year	0.12
5 Year vs. S&P Segment	0.06
10 Year***	0.46
10 Year vs. S&P Segment***	0.41

Revenue & Operating Income Growth

5 Year Revenue Growth**	0.26
5 Year Operating Inc Growth**	0.26
10 Year Revenue Growth***	0.43
10 Year Operating Inc Growth***	0.42

Return on Equity

1 Year	0.13
5 Year	0.13

Return on Assets

1 Year**	0.27
5 Year	0.17

BCG Top 50 - Average DELTA

	With Digital Native	Without Digital Native
On List	3.81	3.56
Not On List	3.24	3.23

Change in Brand Value

	1 Year % Change in Value	2 Year % Change in Value
On List	0.02	-0.05

*Statistical Significance - * P < .10, * P < .05, ** P < .01*

Table 2: Summary group average and correlation coefficients for 36 different metrics including in "Top Company" lists, company valuation, stock performance, and operational performance.

Average Valuation and Investment Return by DELTA Stage

	Market Cap ($B)	5 Year Return	5 Year Return vs. S&P Segment	10 Year Return	10 Year Return vs. S&P Segment
With Digital Natives					
Stage 2	$ 39.1	16.2%	2.3%	0.0%	-7.6%
Stage 3	$ 96.1	16.2%	2.9%	7.2%	0.6%
Stage 4	$ 271.0	26.1%	8.3%	18.1%	7.0%
Without Digital Natives					
Stage 2	$ 39.1	16.2%	2.3%	0.0%	-7.6%
Stage 3	$ 96.1	16.2%	2.9%	7.2%	6.0%
Stage 4	$ 116.0	19.0%	4.3%	7.0%	0.1%

Average Growth by DELTA Stage

	3 Year Revenue Growth	5 Year Revenue Growth	10 Year Revenue Growth	5 Year Operating Income Growth	10 Year Operating Income Growth
With Digital Natives					
Stage 2	5.9%	3.7%	3.1%	8.4%	-0.2%
Stage 3	4.2%	3.4%	5.7%	6.8%	8.2%
Stage 4	11.5%	14.1%	15.0%	18.3%	16.3%
Without Digital Natives					
Stage 2	5.9%	3.7%	3.1%	8.4%	-0.2%
Stage 3	4.2%	3.4%	5.7%	6.8%	8.2%
Stage 4	2.3%	4.3%	6.6%	7.6%	9.3%

Average Valuation and Efficiency by DELTA Stage

	Forward PE	Fortune Most Admired Score	Brand Value Change	5 Year Return on Assets	5 Year Return on Equity
With Digital Natives					
Stage 2	12.3	6.25	20.1%	5.0%	11.2%
Stage 3	18.2	6.88	9.5%	6.0%	9.7%
Stage 4	54.9	7.21	33.0%	8.7%	36.2%
Without Digital Natives					
Stage 2	12.3	6.25	20.1%	5.0%	11.2%
Stage 3	18.2	6.88	9.5%	6.0%	9.7%
Stage 4	20.1	7.01	43.3%	8.0%	65.6%

Table 3: Summary performance by DELTA stage across 36 metrics. The companies in this study had analytics maturity scores ranging from Stage 2 to Stage 4.

ABOUT THE AUTHOR

DAVID ALLES

David Alles is a Vice President with the International Institute for Analytics and leads the company's analytics maturity assessment service line. He brings over two decades of executive, product development and business strategy experience leading teams at rapidly growing technology companies. David has experience at leveraging a wide variety of technologies (Big Data, platform-as-a-service, streaming analytics, IoT) across a number of industries (energy analytics, building automation, SaaS applications, electronic design automation, and manufacturing). David has a BS in Industrial Management from Carnegie Mellon University.

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