

Data Refinement: Facilitating The Data- Driven Organization

How To Approach A Strategy That Will
Provide A Competitive Edge In The
Data Economy

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Executive Summary

The data-driven organization is the new benchmark for success. Firms that harness data to dictate strategic and tactical decisions companywide make more informed business plans, better optimize operations, improve customer interactions, and provide competitive edge. To achieve these benefits, organizations increasingly see data refinement — transforming raw data from various sources into relevant and actionable information and delivering it through self-service access to any user who needs it — as the path toward success by helping break through immature processes and legacy systems. However, data refinement only functions as well as the strategies and approaches behind it. Organizations that do not understand the right way to embrace refinement will fail to catch up to competitors that have mastered the correct approach.

In seeking to understand how organizations are prioritizing data refinement and utilizing it to drive business decisions and influence processes, IBM commissioned Forrester Consulting in December 2014 to conduct an online survey comprising enterprise, information, and data architects as well as application development professionals, totaling 390 respondents. The study was fielded in the US, Canada, Mexico, Brazil, the UK, Germany, France, India, and China, and sought to specifically evaluate how organizations were approaching data through data refinement, with an emphasis on understanding their deployment methods and how data was being served to application development teams.

Over the course of this study, Forrester found that data refinement done correctly provides a competitive edge. Organizations that employ a holistic and companywide data refinement strategy — coupled with a hybrid of cloud and on-premises deployments — realize crucial business benefits and anticipate financial gains over those that take a piecemeal approach.

KEY FINDINGS

Forrester's study yielded four key findings:

- › **Architects and developers do not see data the same way.** Developers stated that architects in IT drive the bulk of requests and requirements for their applications more than any other department in their organization. Yet they see data differently: Developers want more access to data, while architects focus more on its usability and relevance.
- › **Data refinement competency is linked to hybrid cloud success.** Respondents anticipate that a hybrid of cloud and on-premises deployments in equal measure is much more likely to deliver numerous business benefits than an exclusively on-premises or exclusively cloud deployment approach when robust data refinement is applied.
- › **Revenue Generators rely on their hybrid data refinement deployments to drive growth and achieve business benefits.** Forty percent of respondents see hybrid data refinement as a key driver of significant revenue growth. They reported more robust data refinement strategies, greater customer interactions, and a smoother experience integrating on-premises and cloud deployments.
- › **Data refinement is the key to revenue opportunity in the data economy.** Respondents with a holistic data refinement strategy have more confidence in revenue growth and already see increases in cross-sell and upsell results by 69%, compared with those respondents stating they have a limited or fragmented data refinement effort.

A Good Data Refinement Strategy Is A Business Imperative

Business data, once in the realm of technology management, is now vital for all corners of the organization to improve business outcomes. Rising adoption of big data technologies, open data, and the merging of internal and external data enable information-driven decisions to permeate companywide — improving business planning, protecting brand reputation, delivering better customer experience, and increasing competitive advantage. The application of data toward creating insights and value is vital in what Forrester refers to as “the data economy” — a new reality that organizations must prepare for in order to achieve business success today.¹

Data economy success starts with a simple mantra — prioritize data as a strategic priority in the organization. Architects and developers get it; 75% agreed or strongly agreed that their organization needs information enablement in order to achieve business success (see Figure 1). As 78% of respondents in this study confirmed, the first step is to orient and apply a robust data refinement

FIGURE 1
Developers And IT Acknowledge The Importance Of Data In Driving Business Success

“Please rate your level of agreement with the following statements regarding your organization’s approach to data.”

(Showing those rating “agree” or “strongly agree” on a 5-point scale)

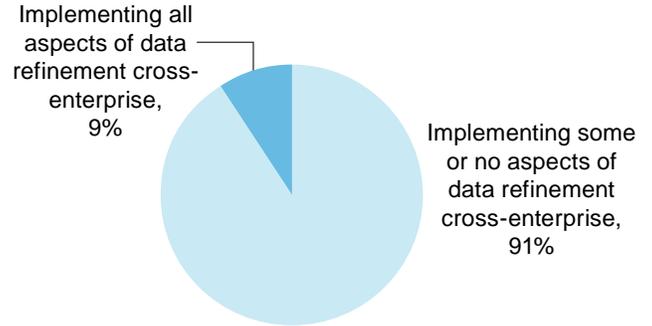


Base: 390 enterprise/data/information architecture and application development professionals

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

FIGURE 2
Over Nine In 10 Architecture And Application Development Professionals Reported A Lack Of Enterprisewide Data Refinement

“To what extent has your firm implemented the following aspects of data refinement?”



Aspects of data refinement

| |
|---|
| Data quality |
| Master data management |
| Data integration |
| Data profiling |
| Standardization and metadata management |
| Data life-cycle management |
| Data security and privacy |
| Reference data management |
| Data governance management tools |

Base: enterprise/data/information architecture and application development professionals

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

strategy guided to support business imperatives (see Figure 1). Forrester compared organizations that have a robust data refinement strategy — the 9% implementing all aspects of data refinement across their entire enterprise — with those with a more piecemeal effort (91%) and saw key differences in the ability to attain topline objectives (see Figure 2). Resulting analysis concluded that:

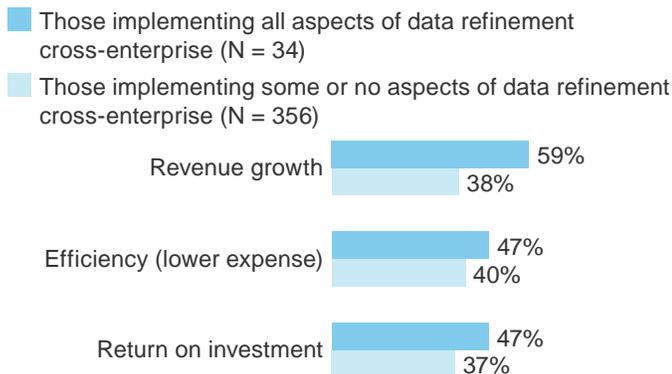
- › **Holistic data refinement strategies are linked to revenue generation.** Holistic data refinement strategies increase ROI by 27% (see Figure 3). Specifically, organizations with comprehensive data refinement strategies show improvement in cross-sell and upsell by a factor of two, and have 1.5 times the competitive advantage over organizations with less comprehensive or fragmented data refinement efforts (see Figure 4).
- › **Data refinement builds better bridges to customers.** Customer experience is top of mind for organizations, specifically the C-suite. Data alignment to this strategy is critical. Holistic data refinement strategies improve this in two ways compared with less robust efforts: a 45% lift in customer interactions and a 55% lift in brand affinity and trust (see Figure 4).

In the data economy, organizations that do not have an effective strategy in place for how they approach data are in danger of being outpaced by competitors that do. In this study, findings show that approaching all of the aspects of data refinement holistically and implementing them across the entire organization offers more than cohesiveness. This approach delivers real business benefits and improves

FIGURE 3
Holistic, Cross-Enterprise Data Refinement Drives Financial Outcomes

“What do you expect the financial impact of your current data refinement strategy will be over the next 12 months?”

(Showing those saying it will have a significant [5% or more] impact)



Base: enterprise/data/information architecture and application development professionals

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

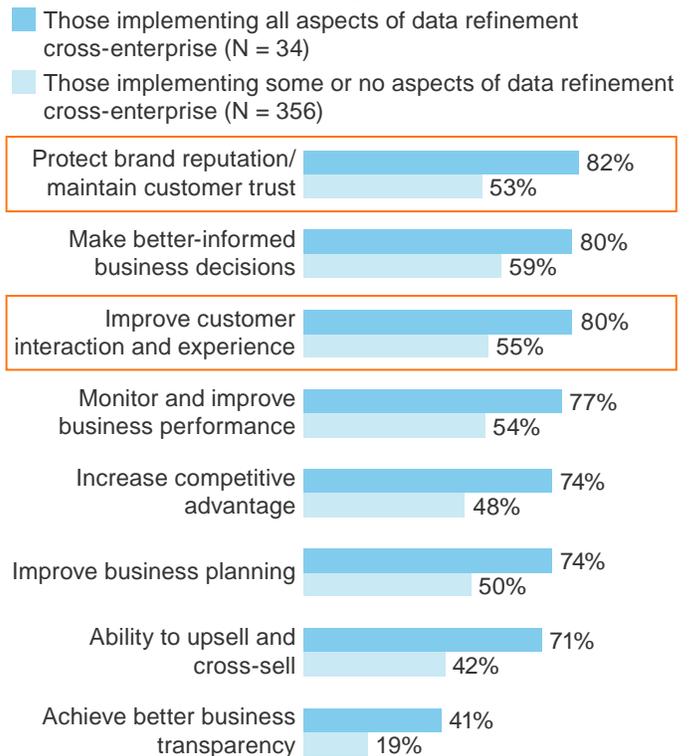
financial results over organizations taking the piecemeal approach, providing those that do have such a strategy in place with a crucial competitive advantage. Responses from architecture and application development professionals signify that:

- › **Implementing all aspects of data refinement across the entire organization yields numerous benefits over those that take the piecemeal approach.** Organizations implementing data refinement holistically are differentiated from those taking the piecemeal approach by the financial impacts they expect their data refinement

FIGURE 4
A Holistic Approach To Data Refinement Yields Numerous Business Benefits

“What impact has your organization’s current data refinement strategy had on the following goals/drivers to date?”

(Showing those saying it has had a high or extremely high impact)



Base: enterprise/data/information architecture and application development professionals whose organizations adopted data refinement to provide data self-service to end users

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

strategy will yield: They reported greater projections of efficiency savings through lower expenses (47% versus 40%) and ROI (47% versus 37%). Notably, organizations that implement data refinement holistically projected that it will yield more significant revenue growth by more than 20 percentage points than those taking the piecemeal approach (59% versus 38%, respectively) (see Figure 3).

STRATEGIC MISALIGNMENT HINDERS ATTAINMENT OF A DATA-DRIVEN BUSINESS

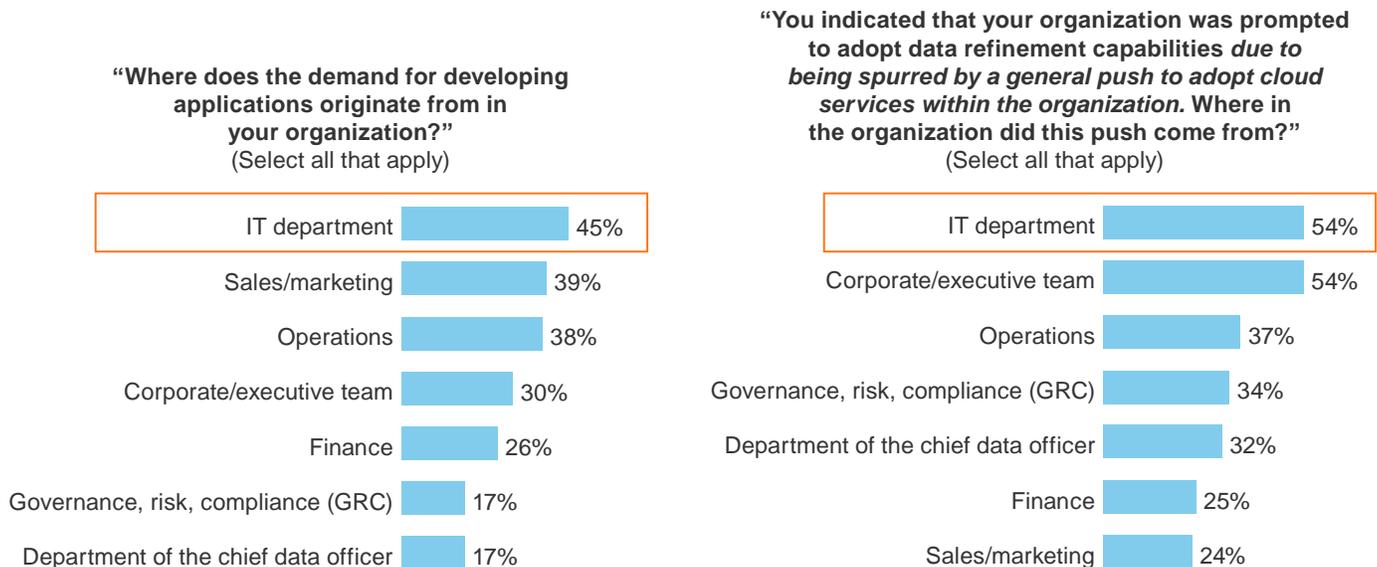
Despite stating that data generally and data refinement specifically are strategic priorities in their organizations, architecture and application development professionals indicated that a sufficient strategy is not in place to implement data refinement effectively. Making data refinement robust enough to deliver business success demands a holistic, planned implementation — all aspects of data refinement must stretch across the organization, and they must be correctly prioritized and coordinated.

Responses indicated that:

- › **IT initiates the bulk of application development and data refinement.** To reach business relevance and attain outcomes, applications need to be business-driven. However, IT is the No. 1 demand generator for application development (45%) and is also driving adoption of data refinement for the cloud (54%) (see Figure 5).
- › **Key business stakeholders become disengaged in data refinement design.** Sales/marketing (39%) and operations (38%) drive demand for new applications. Strategies that move these new business capabilities to the cloud leave their sponsors behind when data refinement strategies are developed. This makes it difficult for new applications to achieve their intended goals when applying the correct refinement to ensure quality and security standards (see Figure 5).

FIGURE 5

Architecture Professionals Initiate Requests And Requirements For Application Developers



Base: 103 application development professionals

*Base: 54 enterprise/information/data architecture and application developer professionals who indicated their organization was spurred toward a general push to adopt cloud services

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

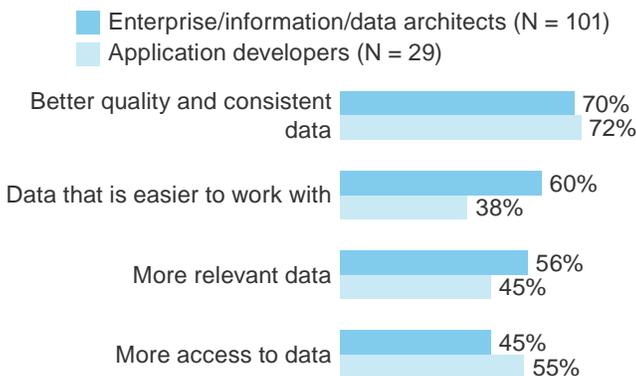
Architects And Developers Are Stewards Of The Data Supply Chain

Achieving success from data refinement strategies requires looking at the entire data supply chain, from collection and aggregation to the delivery of data into the hands of business end users, customers, and partners. Architects and developers have different responsibilities to support required data refinement standards. This is evident in how they prioritize data refinement capabilities and their expectations to deliver trusted secure data. This study found that:

- › **Architects build toward an enterprise strategy for data refinement.** Sixty percent of architects are focused on making data easier to work with (see Figure 6). This means that architects specifically see end user self-service (36%), data quality (36%), and scaling data across the organization (31%) as key drivers for data refinement (see Figure 7).

FIGURE 6
Architecture And Developers Diverge On Self-Service

“You indicated that your organization was prompted to adopt data refinement capabilities due to a desire to provide more data self-service to business end users. What specifically are business end users requesting?”
(Select all that apply)



Base: enterprise/data/information architecture and application development professionals whose organizations adopted data refinement to provide data self-service to end users

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

- › **Architects and developers start off with the same goals in mind.** Ensuring compliance and reducing risk (No. 1), and meeting the pace and demands for data by business end users (No. 2) are key drivers of data refinement adoption (see Figure 7).

FIGURE 7
Architecture And Developers View Data Refinement Differently

“What prompted your organization’s decision to adopt data refinement capabilities?”
(Select all that apply)



Base: enterprise/data/information architecture and application development professionals

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

- › **Developers focus on the task at hand for data.** Fifty-five percent of developers are focused on making data accessible (see Figure 6), and 31% see their data refinement responsibility as reducing the amount of time needed to find and prepare the data (see Figure 7).

Architects need to account for the fact that developers, not just business end users, are their customers in order to succeed at their data refinement strategies. Data sources need to have the data business end users need at the level of trust specified to take action on the data delivered to make it easy for developers to design the needed data services into applications. For their part, developers need to play a stronger role in incorporating additional data refinement rules and processes into the data services. Architects can provide universal data hubs, but further refinement is needed to personalize the data in the context of specific business actions and outcomes envisioned by business end users.

Hybrid Environments Move The Business Forward

As cloud offerings explode in popularity, many organizations are beginning to migrate from strictly on-premises solutions to a combination of both on-premises and cloud solutions. Expectations from data professionals of hybrid environments are that they contribute to key business goals and drivers to a far greater extent — by 22 to 32 percentage points — than an exclusively on-premises approach (see Figure 8). Specifically, this study found that hybrid is positioned for topline objectives of:

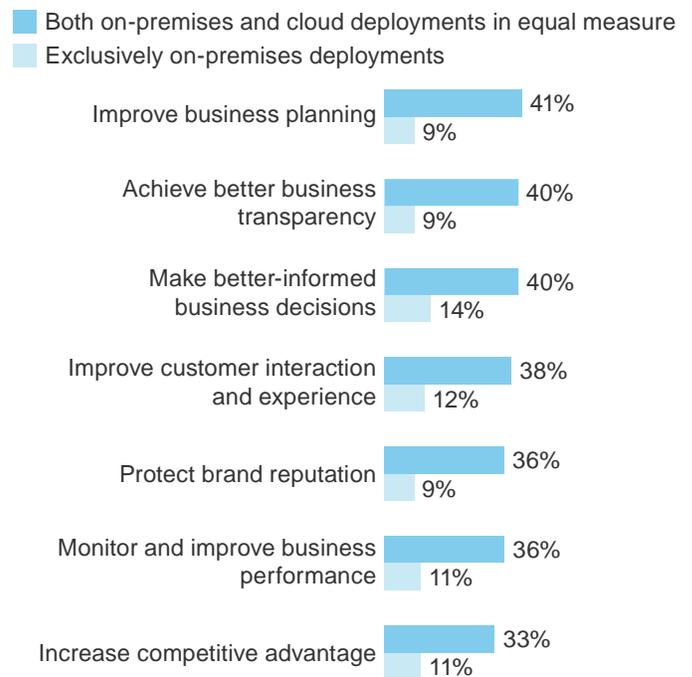
- › **Improved business planning.** Forty-one percent of data professionals look to hybrid environments to address goals in business planning, versus 9% who believe this will be addressed by exclusively on-premises deployments.
- › **Improved customer interaction/experience.** Thirty-eight percent anticipate the hybrid environment will address the goal of improving customer interaction and experience, versus 12% who believe this will be addressed by exclusively on-premises deployments.
- › **Increased competitive advantage.** Thirty-three percent anticipate the hybrid environment will address the goal of giving their organization a competitive edge, versus 11% who believe this will be addressed by exclusively on-premises deployments.

- › **Better-informed business decisions.** Forty percent anticipate the hybrid environment will aid in making better-informed decisions, versus 14% who believe this will be addressed by exclusively on-premises deployments.

FIGURE 8

A Hybrid Of On-Premises And Cloud Deployments Will Address Data Refinement Goals Better Than Exclusively On-Premises Deployments

“Which approach to data refinement do you anticipate will address reaching your organization’s goals/drivers?”
(Select one for each row)



Base: 390 enterprise/data/information architecture and application development professionals

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

FIGURE 9

For Firms With Minimal Data, The Amount Of Data In The Cloud Will Steadily Decrease Three Years From Now

“What percent of each of the data types your organization utilizes is in the cloud?”
(Data from transactional systems on-premises)



Base: 390 enterprise/data/information architecture and application development professionals

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

TAKING THE BUSINESS TO THE CLOUD FALTERS WITHOUT HYBRID DATA REFINEMENT

The optimism with hybrid correlates to the number of organizations that have little to no data in the cloud decreasing by 453% over the next three years (see Figure 9). So as hybrid environments become the norm, data refinement strategies have to adapt.

Cloud can reduce the cost to manage data at the same time it helps organizations accelerate the adoption of modern data platforms and business capabilities that are too costly to develop on-premises. However, a change in location doesn't mean that data challenges go away. In fact, introducing cloud into the business ecosystem can complicate things.

This study found that:

› **Investment in the cloud goes to waste.** Forty-eight percent of architecture and application development professionals at organizations that have already rolled out a hybrid data refinement deployment reported that their strategies have had a significant impact on revenue growth, which is 50% more than those in organizations that do not (see Figure 10).

FIGURE 10

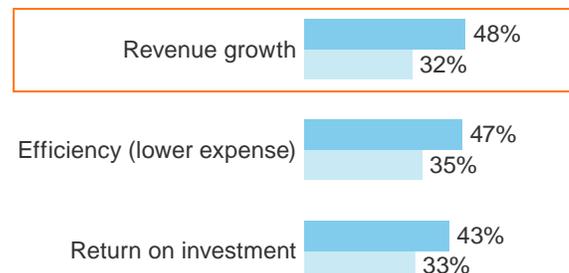
Hybrid Data Refinement Deployments See Greater Financial Outcomes

“What do you expect the financial impact of your current data refinement strategy will be over the next 12 months?”

(Showing those saying it will have a significant [5% or more] impact)

■ Those with hybrid data refinement (N = 189)

■ Those without hybrid data refinement (N = 201)



Base: enterprise/data/information architecture and application development professionals

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

› **Data consistency is lost.** Architects are twice as likely to experience challenges with integrating data as their developer counterparts. Connectors and APIs are readily available to developers looking to link and pass data between software-as-a-service (SaaS) applications. However, data strategies that require building trusted data hubs across cloud and on-premises environments require more attention. Thirty-two percent of architects seek a single data refinement solution to span hybrid environments (see Figure 11).

FIGURE 11

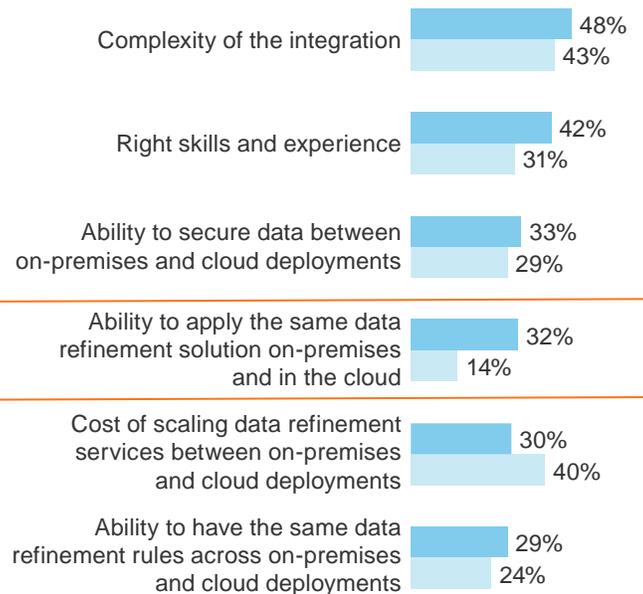
Architects Reported More Integration Challenges Between On-Premises And Cloud Deployments Than Developers

“What integration challenges between your on-premises and cloud deployments did you experience?”

(Select all that apply)

■ Enterprise/information/data architects (N = 128)

■ Application developers (N = 42)



Base: enterprise/data/information architecture and application development professionals

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

Revenue Generators Blaze The Trail For Hybrid Success

Forty percent of architects and developers see data refinement with a hybrid of cloud and on-premises deployments as a driver of significant revenue growth. We call these data professionals “Revenue Generators.” Their expectations translate into additional optimism and preparedness when they expand their ecosystems to include cloud, compared with their counterparts who emphasize bottom line improvement — we call them “Efficiency Drivers.”

Study results showed that:

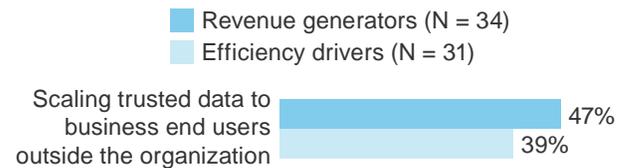
- › **The data economy business model guides the way.** Cloud offers the opportunity for organizations to share data and insights with outside end users such as customers and partners. Revenue Generator organizations are 20% more likely to have these outward-facing strategies to grow their business than Efficiency Driver organizations. Without a robust data refinement strategy, the value of data and insight can be called into question by external end users. In contrast, Efficiency Driver organizations keep to their moniker of internally focused operational improvements (see Figure 12).
- › **Relationships with customers improve.** Revenue Generators are nearly twice as likely as their Efficiency Driver counterparts to increase customer interactions and improve customer experience (see Figure 12). Strong relationships with customers allow these organizations to achieve revenue growth through cross-sell and upsell opportunity as well as maintain a loyal customer base.

FIGURE 12

Revenue Generators Are More Likely To Expect Their Hybrid Approach To Data Refinement To Solve Key Goals And Adoption Drivers

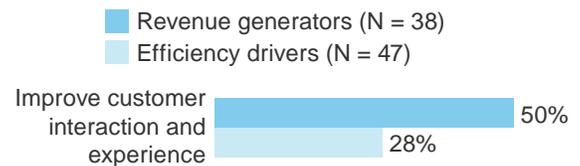
“Which approach to data refinement do you anticipate will address the reasons that prompted your organization to initially adopt these capabilities?”

(Showing those selecting “both on-premises and cloud deployments in equal measure”)



“Which approach to data refinement do you anticipate will address reaching your organization’s goals/drivers?”

(Showing those selecting “both on-premises and cloud deployments in equal measure”)



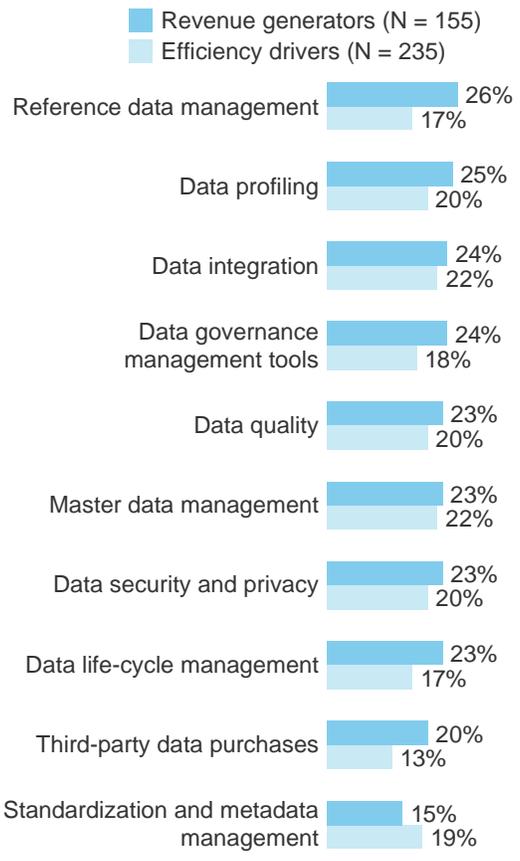
Base: enterprise/data/information architecture and application development professionals

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

› **Robust data refinement strategies lead to tighter business alignment.** Revenue Generators experience fewer challenges than Efficiency Drivers in getting the resources needed to support hybrid cloud. By executing across a wide array of data refinement areas, they are able to be more strategic. In contrast, Efficiency Drivers prioritize cloud data directories (metadata management and data standards) to a greater extent (27% more), missing out on data refinement areas such as data life-cycle management, data augmentation, and reference data management that connect data refinement to business impact (see Figure 13).

FIGURE 13
Revenue Generators Are More Likely To Have Robust Data Refinement Strategies

“To what extent has your firm implemented the following aspects of data refinement in the cloud?”
 (Showing those selecting “expanding existing on-premises to the cloud”)



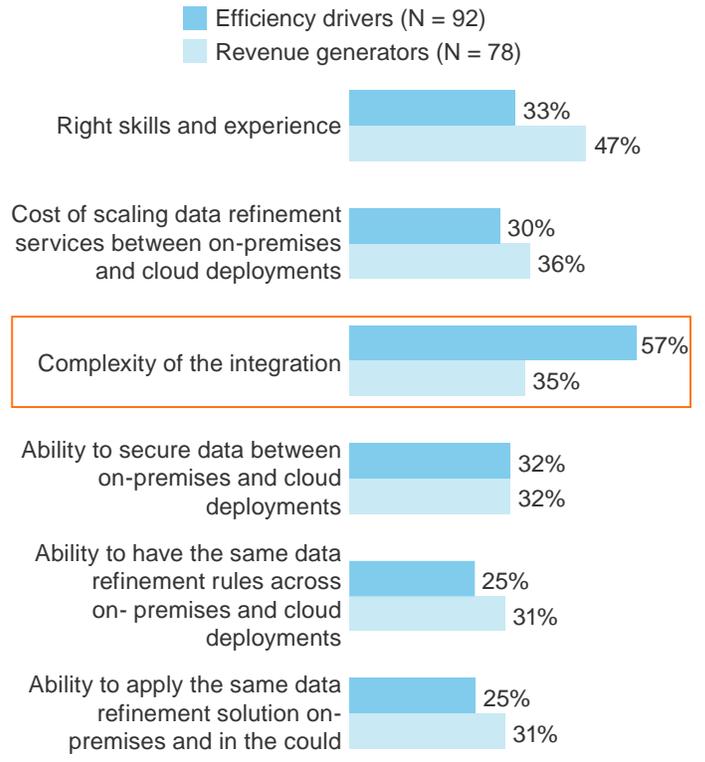
Base: enterprise/data/information architecture and application development professionals

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

› **Expansion to the cloud goes smoother with better return.** Data refinement strategies for hybrid environments allow Revenue Generators to attain greater efficiency and effectiveness on top of revenue generation. Efficiency Driver organizations are 20% more likely to expect higher data refinement costs for hybrid than Revenue Generators. Specifically, the complexity to integrate becomes a greater challenge. Efficiency Driver organizations are 63% more likely to be challenged by data integration over their Revenue Generator counterparts (see Figure 14).

FIGURE 14
Efficiency Drivers Are Particularly Challenged With The Complexity Of On-Premises To Cloud Deployment Integration

“What integration challenges between your on-premises and cloud deployments did you experience?”
 (Select all that apply)



Base: enterprise/data/information architecture and application development professionals

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

Data Refinement-Lite Doesn't Cut It For Hybrid Environments

As organizations seek the ideal solution for data refinement, they must ultimately keep their end users in mind — enterprise and data architects in IT can no longer make data decisions in a silo, resulting in further diverging opinions and needs. Therefore, they must select solutions that end users such as developers are comfortable with, addressing their concerns in order to properly enable self-service.

Although developers are both willing to create and capable of creating custom tool sets to address needs, they are nevertheless receptive to vendor-provided solutions. Developers will select vendor-built solutions over creating their own if these solutions prove to be cost-efficient, readily meet compliance standards, and have a high level of quality out of the box. In this study, developers confirmed this by responding that:

- › They perceive that vendor-built tools have advantages of efficiency, quality, and ease of adoption within their organizations. When choosing tools used to develop applications, developers are more likely to choose vendor-built over customized tools due to these tools being cost-efficient (58%), of better quality (46%), available to roll out organizationwide (46%), and able to better meet compliance standards (45%) (see Figure 15).
- › Most are likely to consider using vendor tools when building applications. Due to positive associations with the value of vendor tools over custom-built solutions in helping to contain costs and improve delivery quality, developers readily admitted they are likely to use vendor-built tools to help them develop applications — 74% are likely to use vendor-provided APIs, and 62% are likely to use prebuilt UIs (see Figure 15).

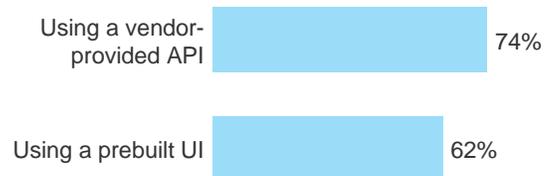
FIGURE 15

Application Developers Recognize The Advantages Of Vendor Tools And Are Willing To Use Them

“Which of the following advantages of packaged (vendor-built) tools are most likely to make you select them over custom/self-built tools when developing applications?”
(Rank the top three)



“Please rate how likely you are to consider the following when developing applications.”
(Showing those rating “somewhat likely” or “very likely” on a 5-point scale)



Base: 103 application development professionals

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, March 2015

Key Recommendations

Decision-makers clearly voice the necessity of data refinement as a driver of business success in the data economy. However, the approaches for both strategy and deployment method will either make or break a rollout. They must understand that taking a holistic approach toward data refinement with a hybrid deployment does not just solve a few challenges — it is a key differentiator that drives success over competitors. The key is to avoid approaching new concepts using traditional strategies. In order to stay in front of the pack, decision-makers must:

- › **Construct data refinement strategies around clear business goals and objectives.** Entering the data economy and extending data and data capabilities from on-premises to the cloud introduces a number of complexities. Decision-makers need a strategic lens for meeting business expectations of growing revenue at the same time as improving efficiency and lowering costs. Data refinement has to extend well beyond data governance areas that show where data came from and exists. Business end users and those outside the organization's walls need to have confidence in the data by knowing it is of high quality, provides a complete view, and meets any regulatory and data security and access requirements. Without a robust data refinement strategy, the broader investments in cloud applications and platforms never realize their potential.
- › **Adopt cloud data refinement tools to drive consistency in hybrid environments.** Enterprise architects see cloud tools as an effective way to scale out actionable information and insight across geography, brand, and products quickly while breaking down customer data silos. It is important, however, to continue to leverage on-premises deployments to capitalize on their compliance and risk reduction advantages. Decision-makers will therefore look at the specific needs of their organizations to configure hybrid deployments in a concerted, intelligent manner.
- › **Increase collaboration between architects and application developers by simplifying the consumption of trusted data.** Architecture professionals approach data from a perspective of maintaining relevancy and trust, while developers seek greater access to feed into their applications. They both, however, agree to an equal degree that data must be consistent and of high quality. Successful organizations will therefore involve developers in decisions involving business data alongside the architects who are responsible for implementing data solutions, and seek specific solutions that enable developers to gain greater access ability to consume data.
- › **Position cloud data refinement tools to expand environment and strategic data use for new business capabilities.** Although organizations acknowledge the general importance of refinement and governance, many are too internally focused and only thinking of internal data types when approaching governance. As more data types emerge and migrate into the cloud, there is more opportunity to utilize this data for decision-making. Therefore, data-driven organizations will think more strategically and work to extend data refinement and governance toward these new data types — an essential step in transforming organizations from Efficiency Drivers to Revenue Generators.

Appendix A: Methodology

In this study, Forrester conducted an online survey of 390 enterprise/information/data architects and application development professionals in organizations of 500 or more employees in the US, Canada, Mexico, Brazil, the UK, France, Germany, India, and China. Questions provided to the participants asked about the scope, level of maturity, and level of success of data management and data refinement strategies in their organization. The study began in February 2015 and was completed in March 2015.

Appendix B: Endnotes

¹ Source: "Data Governance Equals Business Opportunity. No, Really," Forrester Research, Inc., February 26, 2015.