



DESIGNING DIGITAL ORGANIZATIONS— SUMMARY OF SURVEY FINDINGS

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PARTICIPANT REPORT

*a report for research project participants with detailed methodology,
analysis, findings, and references*

TRANSFORMATION
ARCHITECTURE
PLATFORMS
AGILITY
INNOVATION

To succeed in the digital economy, established businesses must develop and apply new technology and organizational capabilities. In August 2016, MIT CISR distributed a survey to 171 senior business and IT leaders about their digital capabilities. We then analyzed how those capabilities related to business outcomes like innovation and agility. This report summarizes findings from that survey and offers recommendations on how companies can stimulate their digital transformations.



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DESIGNING DIGITAL ORGANIZATIONS—SUMMARY OF SURVEY FINDINGS

Since mid-2014, the MIT Center for Information Systems Research (CISR) and The Boston Consulting Group (BCG) have been studying how established companies are redesigning themselves for the digital economy. We are exploring established companies' strategies to make themselves more competitive, and the systems, processes, structures, and management practices they are developing to implement those strategies.

In the first phase of this research (2014–15), we investigated the early efforts of 27 companies in responding to digital disruption. The companies were recognizing the need to replace traditional products and services with digitized solutions that meet customer needs. They were also leveraging digital technologies and greater customer information to enhance customer engagement. These strategic objectives created pressure for greater integration of products, services, and processes across their organizations. They also created pressure to be more agile and innovative. The earlier report from this research highlighted our initial findings on the technological and organizational changes needed to address the new pressures.¹

In the second phase of the research (2016), we surveyed 171 executives² about their strategies, outcomes, capabilities, and management practices to better understand the factors that contribute to successful execution of digital strategies. This report summarizes our findings from our survey analysis. We also conducted several case studies, which will be published in the coming year.

We highlight the following key findings from the survey:

1. Digitized solutions (products) and customer engagement are the two outputs that signal adoption of a digital operating model. The extent to which digitized solutions are integrated and customer engagement is personalized predicts a company's financial performance relative to competitors. Integrated digitized solutions and personalized customer engagement are mutually reinforcing—companies tend to achieve neither or both.
2. Companies that successfully create both integrated digitized solutions and personalized customer engagement demonstrate greater innovativeness and business agility than companies that do not.
3. To build agility and innovativeness, companies rely on three key technology resources:
 - a. A strong operational backbone that provides automated transaction processing and visibility into master and transactional data
 - b. A digital services platform with reusable business, technology, and data components
 - c. Digital linkages that allow newer digital services to access the data and infrastructure services embedded in the operational backbone

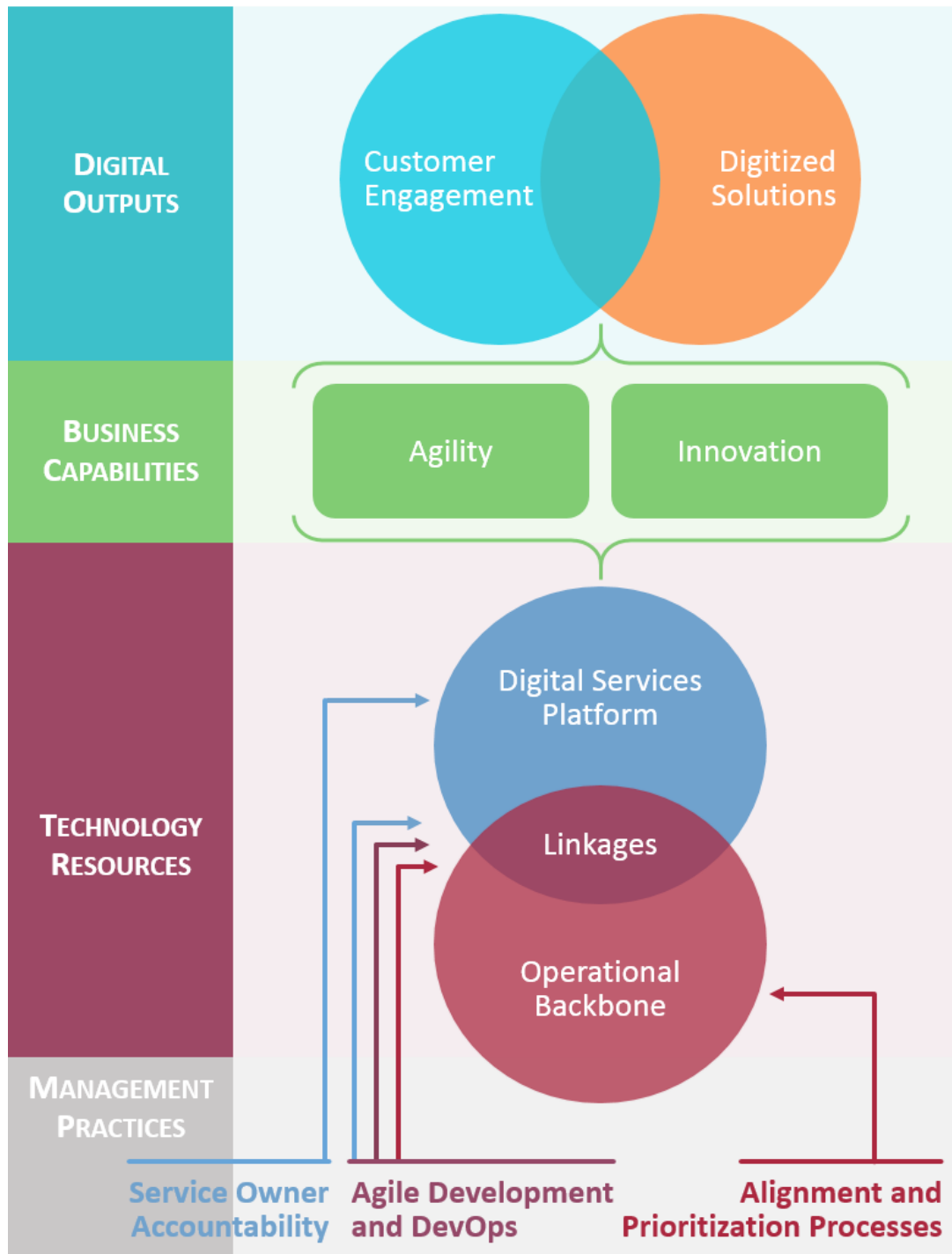
1 See the in-depth report on the first phase of this research: J.W. Ross, I.M. Sebastian, C.M. Beath, S. Scantlebury, M. Mocker, N.O. Fonstad, M. Kagan, K. Moloney, S.G. Krusell, and the Technology Advantage Practice of The Boston Consulting Group, "[Designing Digital Organizations](#)," MIT Sloan CISR Working Paper No. 406, March 2016.

2 The Designing Digital Organizations Survey (N=171), distributed in August 2016, was developed jointly by the MIT Sloan Center for Information Systems Research (CISR) and The Boston Consulting Group (BCG), MIT CISR's collaborator in the research.

4. Companies create technology resources through management practices focused on:
 - a. Governance processes that embrace adherence to architectural principles
 - b. Adoption of business service owner accountability—as opposed to function or product line accountability—as an organizing principle
 - c. Implementation of cross-functional agile approaches to business change

The following figure summarizes these findings.

Figure 1: How Companies Succeed Digitally



These findings are based on statistical analyses—primarily correlations, regressions, and comparisons of means. None of these statistical methods allow us to infer causal relationships. However, our other research often allows us to be reasonably confident in drawing some tentative conclusions about causality. In this report we will provide more detail on the statistical results from the survey. We also draw on our qualitative research to explain the phenomena we are observing.

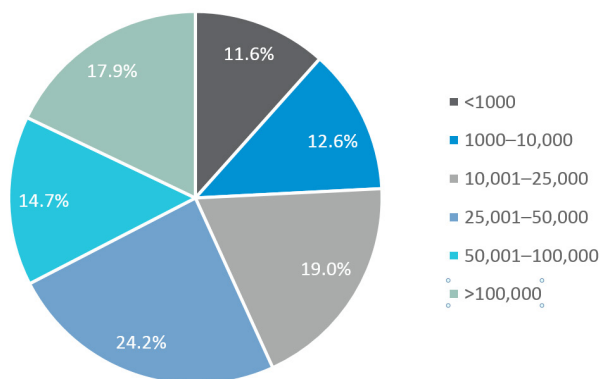
THE RESEARCH SAMPLE

In July-August 2016, MIT CISR distributed a survey titled “Designing Digital Organizations” to members of its patron and sponsor organizations, executives who had responded to prior MIT CISR surveys or attended MIT CISR events, and executive contacts of research team members on LinkedIn. In total, we reached out to 647 executives and received 171 unique, usable responses.

Respondents were asked to complete the survey from the perspective of their entire company, unless they worked in a large, autonomous business unit within a diversified company.

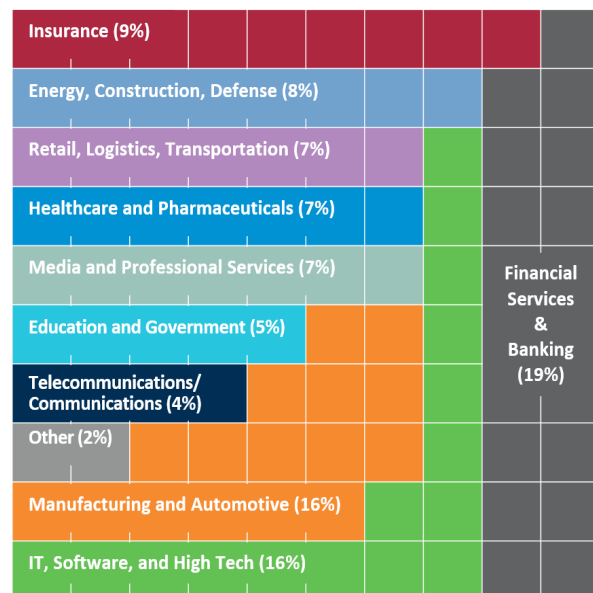
Respondents were mostly from large, global organizations. Almost 90% of respondents were at companies with over one thousand employees.

Figure 2: Survey Respondent Breakdown by Size of Organization

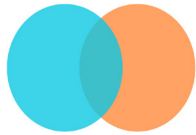


Respondents represented a wide variety of industries.

Figure 3: Survey Respondent Breakdown by Industry



The MIT CISR patron and sponsor member mailing list is heavily weighted toward technology leaders. As a result, 60% of survey respondents were IT leaders. Others held positions in marketing, product development, non-IT digital businesses, and the executive suite. Responses did not differ between IT and non-IT respondents. Approximately 80% of respondents held senior leadership roles (i.e., CEO, CIO or other C-level, EVP, SVP, or business unit head).



TWO DIGITAL OUTPUTS: HOW COMPANIES DISTINGUISH THEMSELVES

Our research suggests that as companies transform for the digital economy, they leverage digital technologies and electronic data to distinguish themselves from competitors through their **customer engagement** and **digitized solutions**.

Variations in customer engagement are evident in the following characteristics:

- Seamless across channels
- Consistent across sales and services
- Responsive to changing customer expectations
- Generating deep insights into customers
- Engaging the customer in a personalized relationship
- Differentiated by customer segment
- Able to connect customer with a related community
- Differentiated from experience with competitors

In summary, we think of these characteristics as indicating the extent of personalization of a company's customer engagement.

Digitized solutions—a company's digital or digitally enhanced products and services—can vary on the following characteristics:

- Enriched with meaningful information and insights
- Responsive to new emerging opportunities in the market
- Integrated to provide a customer solution
- Seamlessly including partner products and services
- Differentiated from competitor products

In summary, we think of these characteristics as indicating the extent of integration of a company's digitized solutions.

Survey respondents' assessments of the degree to which their company's customer engagement and digitized solutions had these characteristics were highly correlated ($R=.78$; $p=.000$). Companies with highly personalized customer engagement tended to have highly integrated digitized solutions and vice versa; although these two outputs are conceptually very different, they are complementary. Companies that are intimately engaged with their customers are quick to recognize demands for digitized solutions. Companies engineering new digitized solutions report that they must engage with their customers to help them generate benefits from the company's new offerings.

Despite the correlation between the two digital outputs, we encourage companies to choose one output as a way to prioritize digital investments and focus digital initiatives. Ultimately, it appears that companies will generate neither or both of these outputs, but prior MIT CISR research suggests that companies are more likely to generate personalized customer engagement and integrated digitized solutions when they are crystal clear about which one is more important. In many respects this is an organizational question regarding whether the company intends to be marketing/sales driven or product development/engineering driven. It appears that either approach can be successful. But failure to commit to one focal point may result in competing efforts that each integrate parts of the operating model. The impact will be less integration overall.³

3 For a more thorough discussion of the digital strategy decision, see Jeanne W. Ross, Ina M. Sebastian, and Cynthia M. Beath, "How to Develop a Great Digital Strategy," MIT Sloan Management Review, Winter 2017, <http://sloanreview.mit.edu/article/how-to-develop-a-great-digital-strategy/>.

How Digital Outputs Relate to Performance

Customer engagement and digitized solutions are strongly related to performance outcomes. The more intimate a company's customer engagement, and the more integrated its digitized solutions, the higher are its self-reported profitability, efficiency, and customer satisfaction (relative to its industry peers). However, the two outputs are not related to self-reported revenue growth. Our case studies help explain why profits and customer satisfaction may be realized sooner than revenue growth.

Case study companies that introduced new integrated digital product offerings, such as energy management solutions, integrated healthcare services, or transportation and logistics solutions, found that customers could not readily imagine why they needed or should pay for new digitized solutions. Even companies aggressively pursuing digitized solutions reported that the vast majority of their revenues were still from traditional products and services. Thus, we do not find it surprising that companies with new integrated digital products are not yet seeing enterprise-wide revenue growth. But digital product offerings demand highly integrated systems and processes. So it's also not surprising that companies implementing these solutions are reporting higher efficiency and customer satisfaction: either they became both efficient and responsive to customers as they implemented integrated solutions, or because they were integrated (and efficient and responsive) they were able to implement digital solutions.

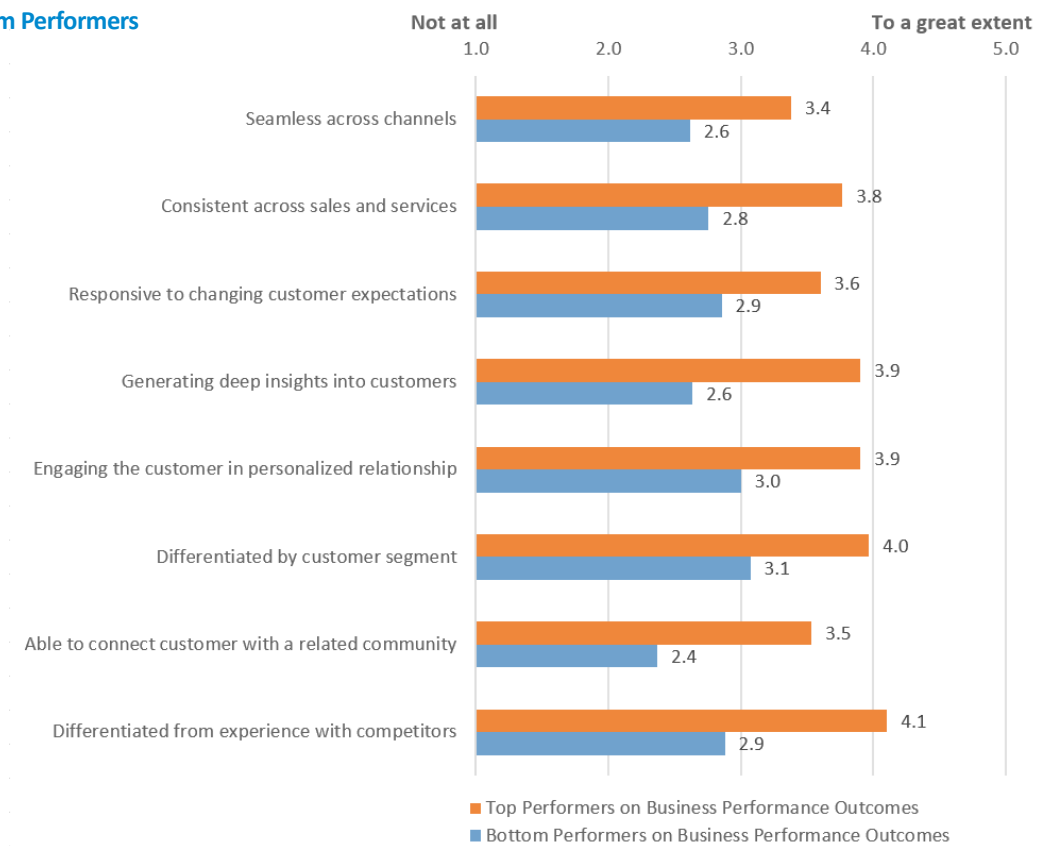
In our case studies of companies with personalized customer engagement, we noted that efforts to enhance customer engagement were paying off, in the short term anyway, by helping to build loyalty among current customers. Although such loyalty could lead to increased revenues, the more immediate impact is apparent in customer retention and in customer satisfaction scores. Customer engagement initiatives demand and create customer data that yields insights into customers. Longer term, these insights could lead to an enhanced reputation for customer service, to product enhancements that attract new customers, or both.

How Top Performers Distinguish Themselves

Survey respondents rated the extent to which their companies exhibited the characteristics of personalized customer engagement and integrated digitized solutions, ranging from 1 (not at all) to 5 (to a great extent). The following two tables compare the average scores of companies in the top and bottom quartiles relative to competitors—i.e., the top and bottom performers—on self-reported efficiency, profitability, and customer satisfaction.

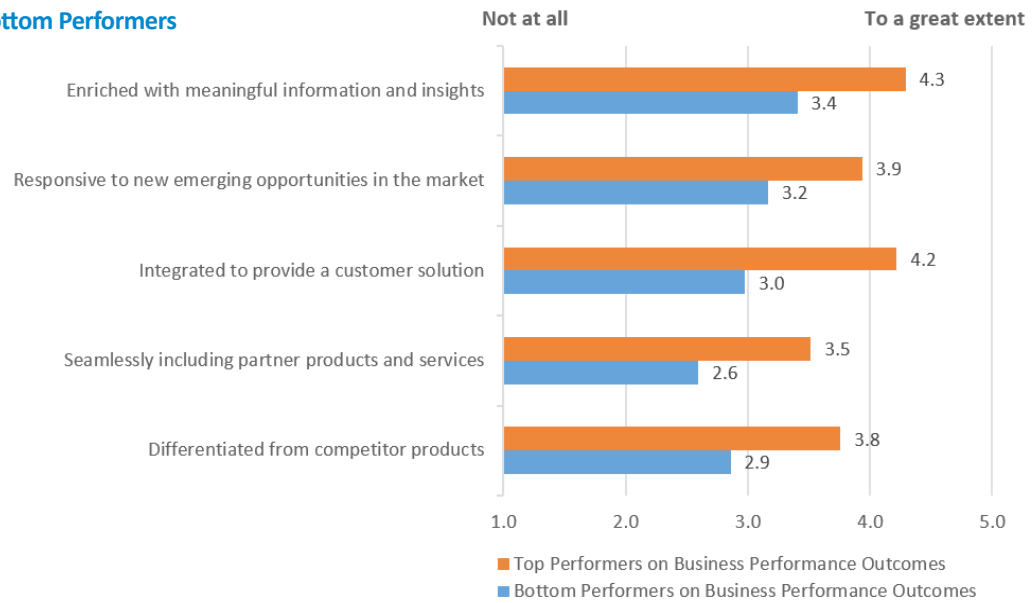
Respondents' assessments of their customer engagement showed that top performers significantly surpassed bottom performers on every characteristic of customer engagement. Top performers generate deep customer insights and use those insights to create differentiated, personalized, and competitively distinctive customer experiences. (We did note that providing a seamless customer experience across channels is a challenge even for top performers.)

Figure 4: Customer Engagement by Top and Bottom Performers



Top performers also scored significantly higher than bottom performers on every characteristic of digitized solutions. Top performers are particularly focused on using data to enrich product offerings with meaningful insights. Many are increasingly packaging products with information to make their products more valuable. That effort is reflected in a high score on the integration of the company's products and services. But scores suggest that in general companies are less eager—or less able—to integrate their products with those of partners.

**Figure 5: Digitized Solutions
by Top and Bottom Performers**



Delivering personalized customer engagement and integrated digitized solutions presents new challenges to established companies—companies whose prior success more often depended on deep-seated functional competencies or business unit excellence. Now these companies must respond quickly to new customer demands and the opportunities presented by new technology. Often, they will need to overcome established business unit and functional structures to effectively integrate their products and information.



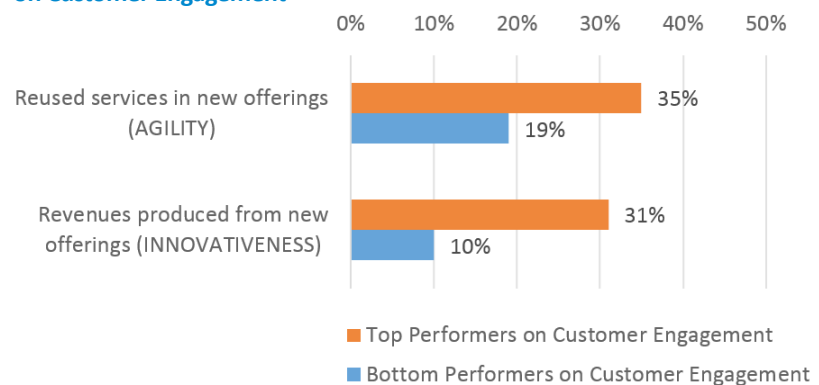
DIGITAL BUSINESS CAPABILITIES: AGILITY AND INNOVATIVENESS

In the pre-digital economy, many companies drove performance improvements by increasing efficiencies. In the digital economy, efficiency is valued, but it is not enough. Customer expectations rapidly escalate, and new technologies constantly offer opportunities to meet those expectations—or to reinvent an industry. To produce integrated digitized solutions and personalized customer engagement in ways that offer sustained competitive benefits, companies will also need to exhibit agility and innovativeness.

To explore the importance of agility and innovativeness, we ranked companies on the personalization of their customer engagement and the integration of their digitized solutions. To do so, we developed a composite measure of both customer engagement and digitized solutions and used these measures to divide companies into four quadrants; companies in the top quadrants were top performing, and those in the bottom quadrants were bottom performing.

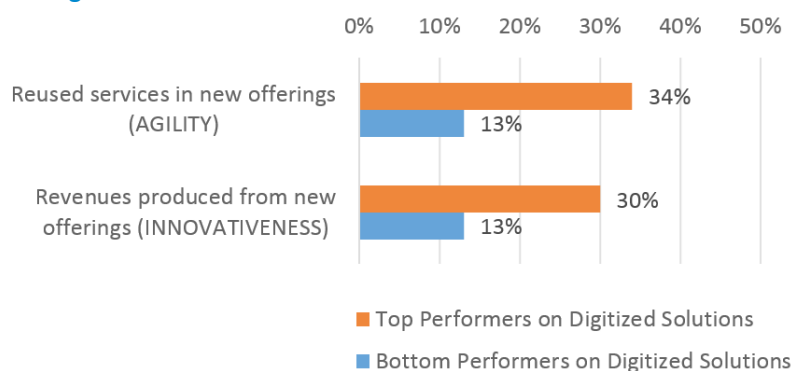
On the customer engagement metric, top-performing companies had created 35% of their new digital products and services from existing services/microservices, compared to only 19% by bottom-performing companies. Similarly, top performers had derived 31% of their revenues from products and services introduced in the last two years, versus just 10% by bottom performers.

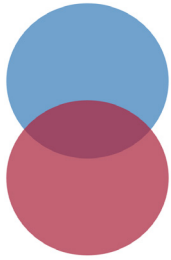
Figure 6: Agility and Innovativeness of Top and Bottom Performers on Customer Engagement



Top-performing companies on the composite digitized solutions measure had created 34% of their new digital products and services from existing services/microservices, compared to 13% by bottom-performing companies. Top performers had derived 30% of their revenues from products and services introduced in the last two years, versus 13% by bottom performers.

Figure 7: Agility and Innovativeness of Top and Bottom Performers on Digitized Solutions





KEY TECHNOLOGY RESOURCES THAT SUPPORT AGILITY AND INNOVATION

Given the relationship between agility and innovativeness and a company's ability to deliver both integrated digitized solutions and personalized customer engagement, a key concern of this research is understanding how companies become more agile and innovative. To address this question, we asked survey respondents to describe their technology environments. Not surprisingly, we learned that technology capabilities are highly correlated with agility and innovativeness.

The first phase of our research highlighted the importance of a strong operational backbone for established companies trying to become more digital.⁴ This operational backbone supports operational excellence by ensuring seamless transaction processing, access to master data, and the scale, security, and reliability that global enterprises need to run their businesses. More recently, we recognized the importance of a digital services platform.⁵ The digital services platform takes advantage of new technologies and partnerships to facilitate rapid introduction of new functionality. Together, the operational backbone and digital services platform facilitate agility and innovativeness in a reliable, secure, scalable business environment.

Our survey sought to distinguish the features of the operational backbone and digital services platform. We developed a list of nineteen technological features that our early research had identified as potentially important to delivering digital outputs. Indeed, all nineteen of these features were significantly related to the delivery of digital outputs (customer engagement and digitized solutions). More to the point, each feature related to measures of either or both agility and innovativeness. These features were rated on the survey using a scale of 1 (not at all) to 5 (best in class).

We anticipated that statistically all of the nineteen features of the technology resources would align with either an operational backbone (i.e., operational excellence) or a digital services platform (the foundation for flexibility and learning). This was largely true, but we found that the nineteen technology resources features actually separated into three distinct concepts rather than two. Thus, our research suggests that companies seeking agility and innovativeness rely on *three* key technology resources: an **operational backbone**, a **digital services platform**, and **digital linkages**.

The operational backbone is represented by a set of six features:

- Automates repetitive business processes
- Accesses single source of truth
- Supports seamless end-to-end transaction processing
- Provides visibility into transactions
- Ensures reliable, stable, secure operations
- Is architected in a modular way

⁴ For more information on the need for an operational backbone, see J.W. Ross, I.M. Sebastian, C.M. Beath, S. Scantlebury, M. Mocker, N.O. Fonstad, M. Kagan, K. Moloney, S.G. Krusell, and the Technology Advantage Practice of The Boston Consulting Group, "[Designing Digital Organizations](#)," MIT Sloan CISR Working Paper No. 406, March 2016; and J.W. Ross, I.M. Sebastian, and C.M. Beath, "[How to Create a Great Digital Strategy](#)," MIT Sloan CISR Research Briefing, Vol. XVI, No. 3, March 2016.

⁵ For more information on the digital services platform, see J.W. Ross, I.M. Sebastian, and C.M. Beath, "[Digital Design: It's a Journey](#)," MIT Sloan CISR Research Briefing, Vol. XVI, No. 4, April 2016 (Revised February 2017).

The digital services platform is represented by a set of ten features:

- Provides access to a repository for reusable business services
- Provides access to a repository for reusable technology services
- Supports partner-created services
- Is API accessible to external partners
- Is API accessible to internal partners
- Provides access to a repository for analyzing sensor data
- Provides access to a repository for analyzing social media data
- Leverages a cloud-based platform (PaaS)
- Leverages open source software
- Facilitates experiments via A/B testing

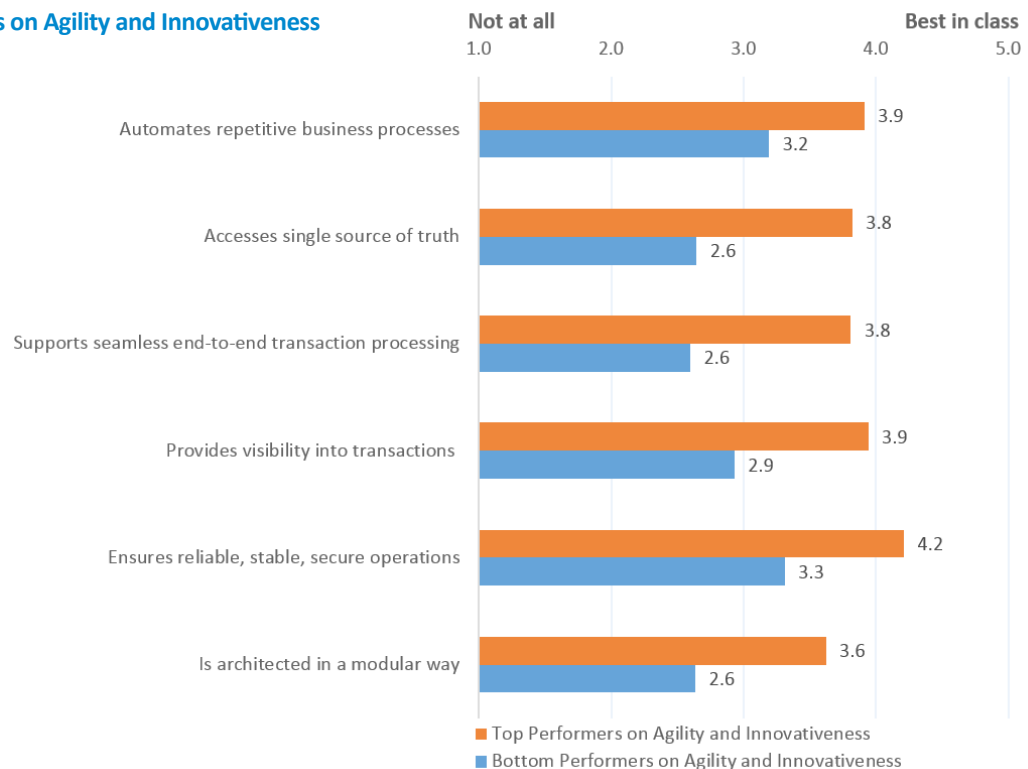
Digital linkages are represented by three features that relate to the transfer of data between the other two technology resources:

- Allows digital services to access customer master data
- Allows digital services to access product master data
- Links digital services to transaction processing systems

To understand how these three technology resources relate to agility and innovativeness, we developed a composite metric capturing two measures each of companies' agility and innovativeness. For agility we relied on (1) respondents' estimates of how much of a new offering was constructed from existing products, services, or microservices; and (2) respondents' ratings of their time to market on a scale of 1 (performing significantly below competitors) to 5 (performing significantly above competitors). For innovativeness we asked respondents to rate their innovativeness on the same scale, and to estimate the percentage of their revenues generated from products or services (or significantly new features) within the last two years. We combined these four measures to identify top and bottom quartiles—i.e., top and bottom performers—on agility and innovativeness. As the tables below show, the most agile and innovative companies scored significantly higher on every feature of the technology resources.

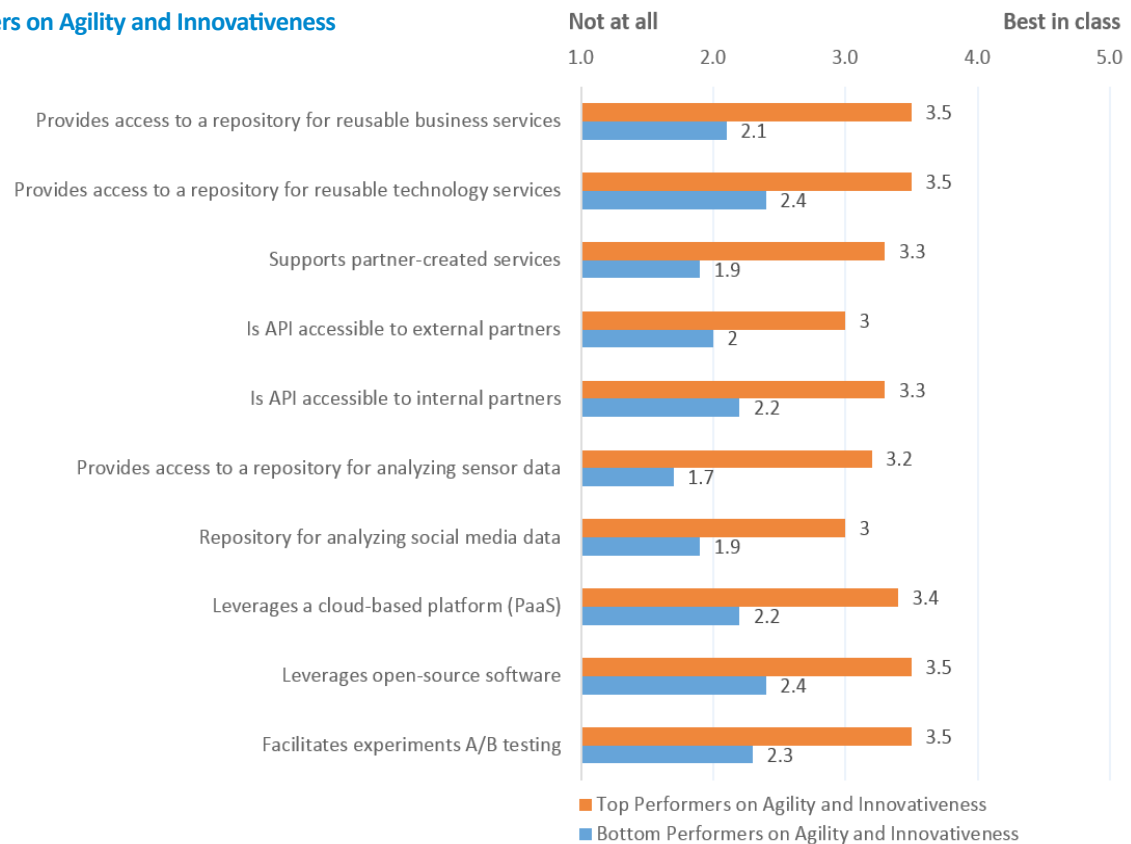
The list of features for the operational backbone includes the objectives for many companies' implementations of core technologies like ERP and CRM systems and shared customer databases. Effective implementation of these technologies involves business process standardization. Standardized technology and business processes not only make companies more efficient, they facilitate technology and process reuse—which are key to business agility.

Figure 8: Operational Backbone Features of Top and Bottom Performers on Agility and Innovativeness



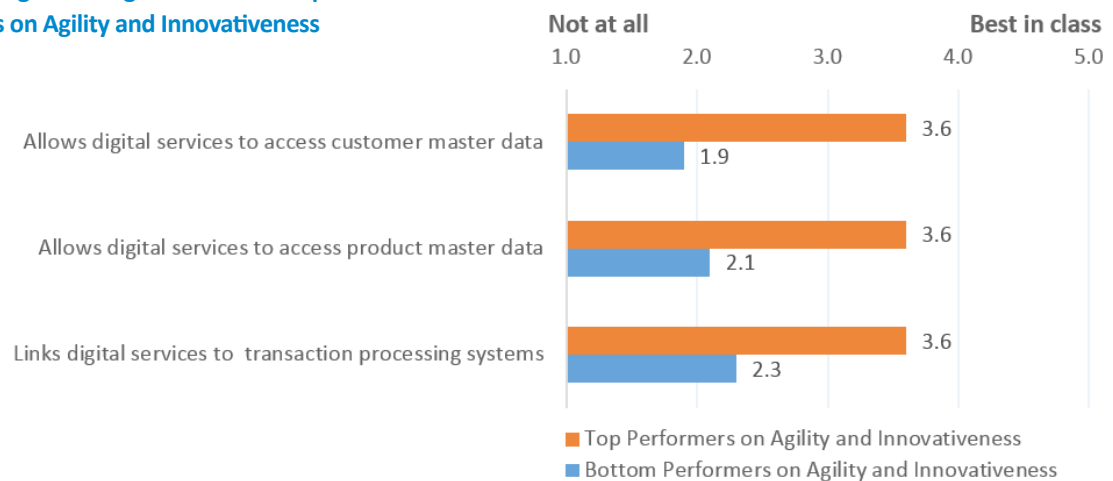
The differences between top and bottom performers in the average scores for digital services platform features revealed a wide gap between the most and least agile and innovative companies in our survey. This may be because 70% of the companies responding had not yet started to build a digital services platform: when they rated their digital platform features, they responded with a 1 (not at all) or 2 (just beginning to build) on a majority of the features. But the features of a digital services platform are adopted for purposes of facilitating agility and innovativeness—and our analysis suggests that is exactly the impact the features have.

Figure 9: Digital Platform Features of Top and Bottom Performers on Agility and Innovativeness



Finally, we saw a similar wide spread between the most and least agile and innovative companies in their descriptions of their digital linkages. Linkages allow companies to access transactional or master data to support their digital services and digital customer engagement. Similarly, they allow customers to complete transactions through new digital channels. Like the digital services platform does, digital linkages allow companies to distance themselves from competitors pretty quickly.

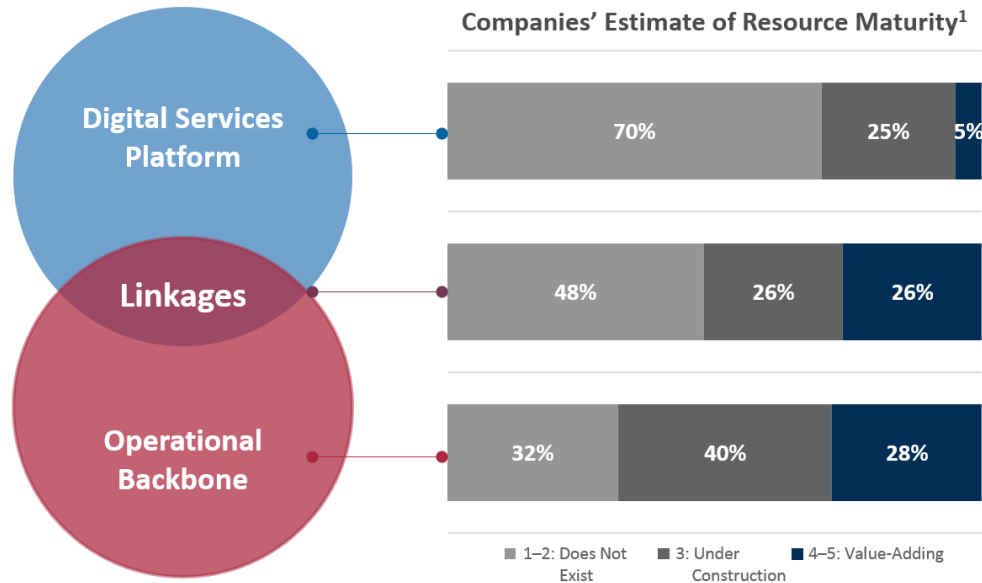
Figure 10: Digital Linkages Features of Top and Bottom Performers on Agility and Innovativeness



We averaged each company's scores across the features of each key technology resource to roughly estimate the maturity of that resource. We evaluated that if the average score for a technology resource is between 4 and 5, that resource is value-adding. In contrast, an average score of between 1 and 2 indicates that the resource does not exist. An average score of between 2 and 4 indicates a resource early in its maturity. The graph below summarizes this.

Figure 11:
Status of
Companies'
Technology
Resources

¹ Respondents indicated on a scale of 1–5 whether each set of features does not exist within their company (1–2), is under construction (3), or is adding significant value (4–5).



As shown, only 5% of companies (8 of 171 companies) scored an average of 4 or more on the features of the **digital services platform**. The scarcity of value-adding digital services platforms is almost certainly limiting the progress of established companies in becoming more agile and innovative. The fact that our research sample was composed almost exclusively of established firms is probably an important factor in this finding. Our sense is that start-ups often build their digital services platform before building their operational backbones. Their digital services platforms are the conduit for connecting with customers to deliver products. In fact, to visualize what a digital services platform is, established firms may find it helpful to examine the developer platforms of start-ups and other technology companies (e.g., <https://developer.uber.com>, <https://developer.amazon.com>). These developer platforms offer a peek, at a high level, at the company's digital services platform architecture.

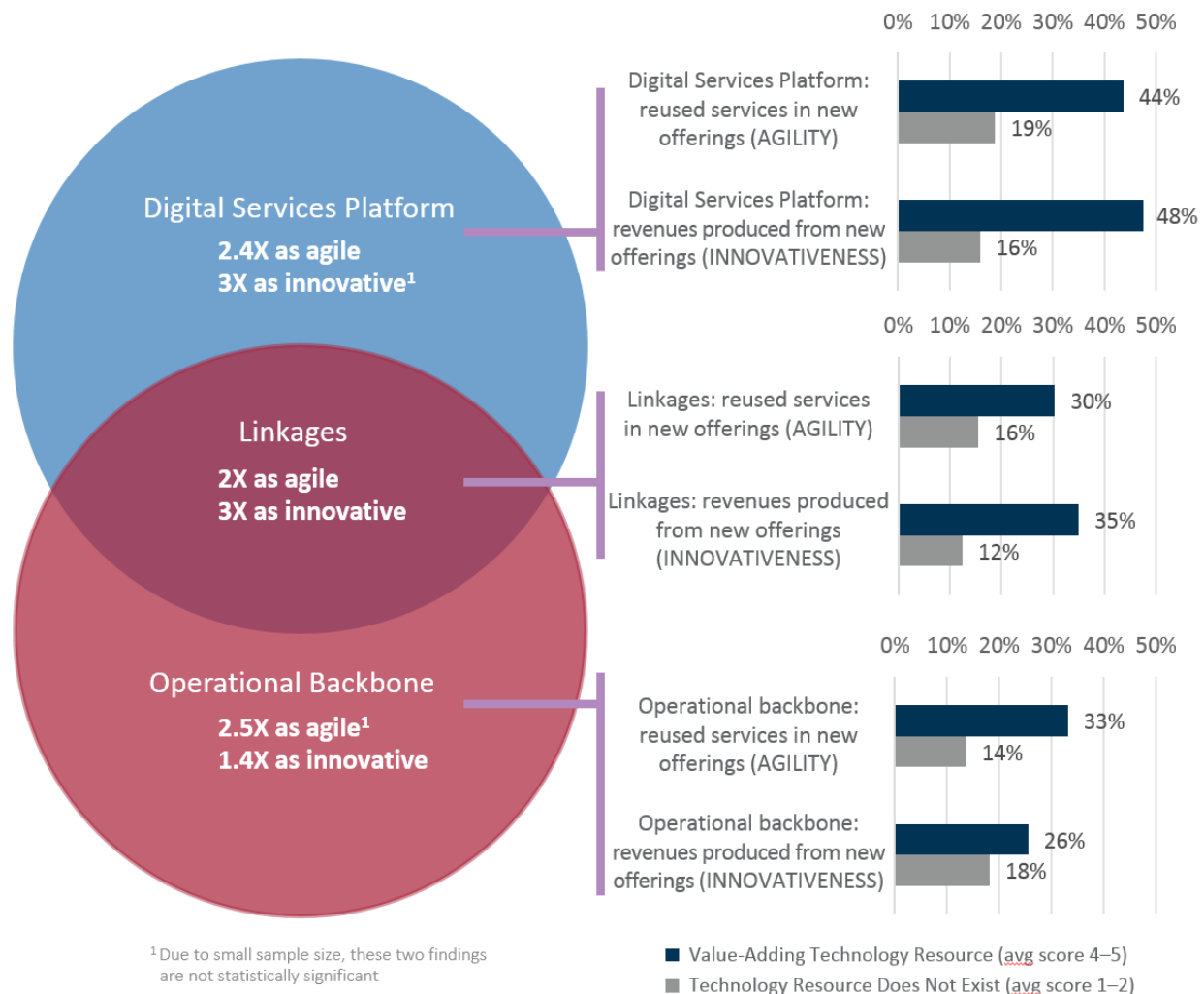
The surprise in the above graph is that far more companies had developed **digital linkages** than digital services platforms. We had assumed that the linkages would link the digital services platform to the operational backbone. Instead, what companies appear to be doing is creating one-off linkages (e.g., APIs) to elements of their operational backbones on an as-needed basis, rather than building and managing a digital services platform.

Despite years of investments in core systems at most established firms, only 28% of our respondents had a value-adding **operational backbone** (average score of at least 4). Almost one-third of companies had barely begun to deploy such a platform. Our prior research proposed that the operational backbone is “table stakes” for the digital economy. Start-ups sometimes fail to develop an operational backbone due to the emphasis on developing a digital services platform. Established firms, on the other hand, have more often tried to build an operational backbone but struggled to overcome the complexity of legacy systems and processes. Companies without an operational backbone may be fighting for survival in the coming years. They may be able to accelerate development of an operational backbone by externally sourcing more of their core processes—although they will want to carefully architect their systems and processes as they do so.⁶

⁶ For a further discussion of how external sourcing can accelerate platform development, see N.O. Fonstad and J.W. Ross, “[Building Business Agility: Cloud-Based Services and Digitized Platform Maturity](#),” MIT Sloan CISR Research Briefing, Vol. XV, No. 2, February 2015.

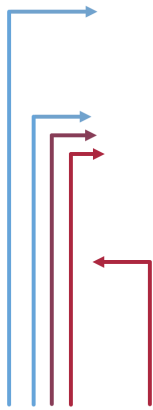
The graph below shows the relationships between percentage of reuse (a measure of agility) and percentage of revenues from new products (a measure of innovativeness) and each of the technology resources. Specifically, we contrast the agility and innovativeness of the companies with a cumulative score of an average of 4 or better for a technology resource with those scoring an average of 2 or less.

Figure 12: Agility and Innovativeness Impacts of Technology Resources



Clearly, strong technology resources deliver benefits of agility and innovativeness. This is true for all three resources. We suspect, however, that the benefits from linkages—when developed without a mature digital services platform—might be short lived. Past research suggests that these one-off linkages could eventually create a messy, unmanageable legacy.⁷ Our study of more mature companies suggests that linkages can be architected into either the digital services platform or the operational backbone. We expect there are long-term benefits to architecting rather than just building linkages.

⁷ For a discussion of the risks of building systems without underlying architectural principles, see J.W. Ross, P. Weill, and D.C. Robertson, *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution*, Harvard Business Review Press, 2006.



MANAGEMENT PRACTICES: HOW COMPANIES BUILD AND USE TECHNOLOGY RESOURCES

As established companies recognize the need for mature technology resources, we expect they will intensify efforts to build all three key technology resources. To do so, they will find it beneficial to observe the governance and management practices that help companies build and leverage technology resources.

We assembled a list of sixteen management and governance practices that companies in our early research were adopting. We asked respondents to rate their practices on a scale of 1 (not at all) to 5 (established, value-adding practice). Fourteen of these practices grouped into three distinctive sets of practices. Each of the three sets helped predict the degree of development of at least one of the three technology resources:

Traditional alignment practices are especially important to an operational backbone.

- Cross-functional architectural reviews
- Enterprise prioritization of technology initiatives
- Enterprise roadmap for infrastructure
- Enterprise investment management process
- Established architectural principles

The design of services and assignment of accountable service owners is important to a digital services platform.

- Service owner management of cost and quality
- Service owner management of revenue and profit
- Service evaluation, prioritization, and discard
- Formal evaluation of ecosystem partners

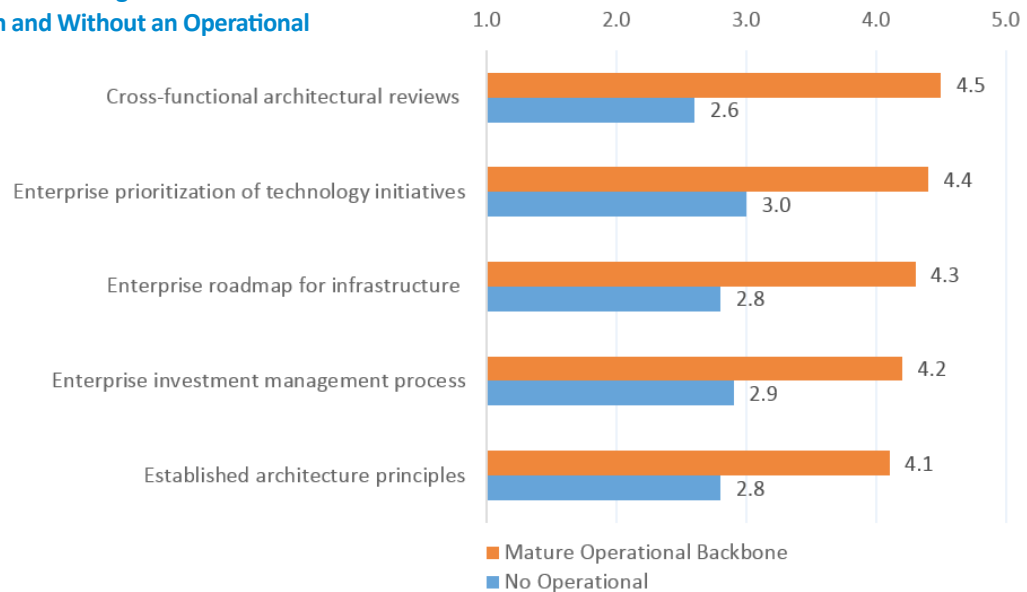
Agile, iterative methodologies engaging cross-functional teams are important to digital linkages. These methodologies are also related to both the operational backbone and digital services platform.

- Iterative, cross-functional development
- Formal user-centered design principles
- Recruiting of creative thinkers
- Minimal Viable Product approach
- Automatic assigning of services to servers

We analyzed the differences in respondents' ratings of their practices based on the maturity of the key technology resource with which the practice set was most closely associated. As expected, for each of these sets of practices, the companies with value-adding technology resources reported significantly more established management practices than companies without these resources. This is reflected in the tables below.

Five practices related to alignment are particularly critical to the operational backbone. Most established companies have been implementing practices like these for many years. Generally, we think of these practices, notably cross-functional architectural reviews, as fundamental to architecture management. And most established companies recognize the need to define a target state for their operational backbones and then to develop roadmaps and invest in initiatives that deliver on those roadmaps. Nonetheless, many companies still struggle to implement such practices. This graph shows how important these practices are in the development of a value-adding operational backbone. This figure reflects the scores on the practices from companies with value-adding operational backbones (composite score of 4.0 or better) and those with no operational backbone.

Figure 13: Architectural Management Practices of Companies With and Without an Operational Backbone

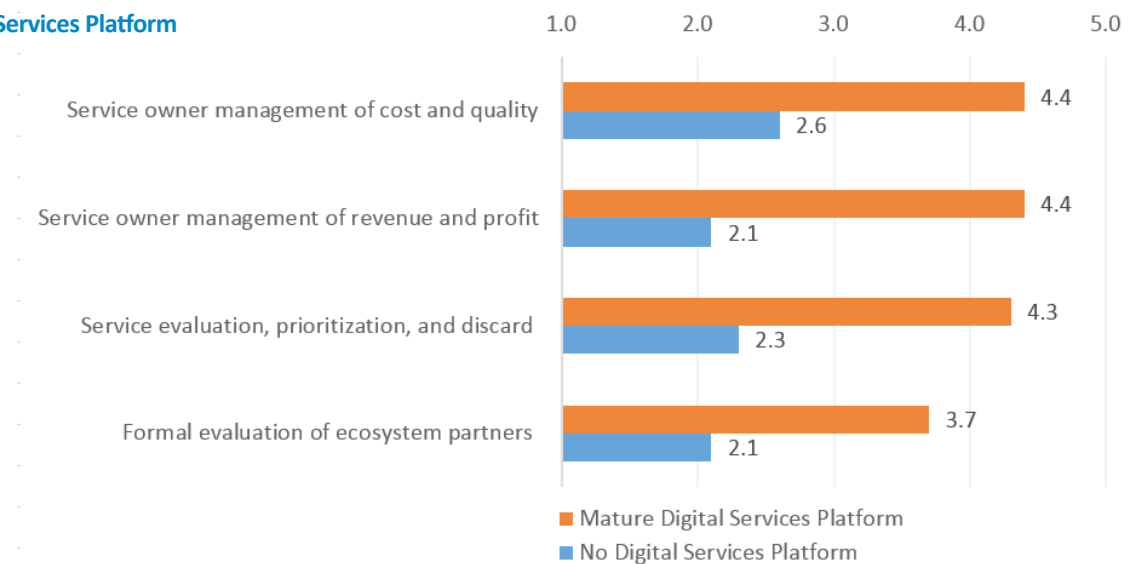


Perhaps the biggest cultural challenge that the digital economy is presenting is recognizing that traditional hierarchies move too slowly. They do not allow companies to respond quickly enough to customer expectations or to new opportunities for digitized solutions. To gradually replace hierarchies—at least in part—we have found that companies are redesigning accountabilities in ways that empower their employees. To do this they are componentizing their technology resources and business processes (referring to them as services, capabilities, or products) and assigning them owners.

Four practices are related to the design of and accountability for business and technology components (which we refer to as services). Although many IT units have experimented (and even deployed) services management practices in recent years, few companies have adopted services management concepts beyond IT operations. We believe, however, that services will become the dominant organizing principle in companies.

Services management practices are particularly important to building and using the digital services platform. This graph compares the scores of the 5% of respondents with mature digital services platforms⁸ to those with no digital services platform:

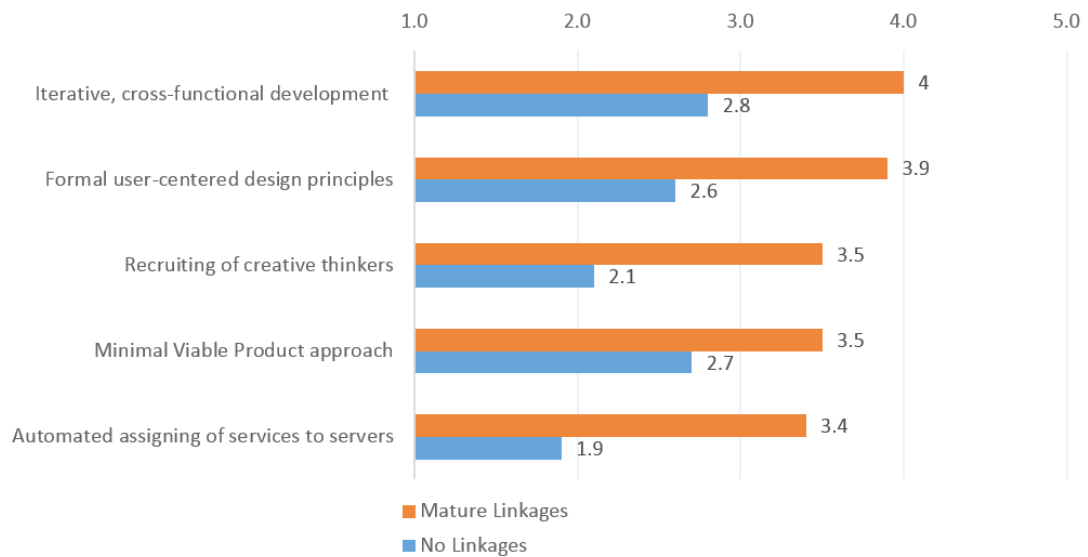
Figure 14: Services Management Practices of Companies With and Without a Digital Services Platform



⁸ Despite the small sample size, these results are statistically significant.

Finally, five practices are related to iterative, agile, cross-functional approaches to business change projects. Agile methodologies are often identified as an alternative to the waterfall approaches to IT development that companies have traditionally relied upon. In companies that deploy effective business change, however, we would argue that agile methodologies represent far more than a new methodology—they represent a new approach to business change. Most importantly, these companies recognize that despite increasingly integrated business environments, interdependent parts of the company must jointly enact changes. As noted, these business change techniques predict the maturity of all three technology resources. This graph shows how those practices differ at firms with mature digital linkages compared to firms with no digital linkages. Comparisons to the basis of maturity of the operational backbone and digital services platform look very similar.

Figure 15: Business Change Management Practices of Companies With and Without Digital Linkages



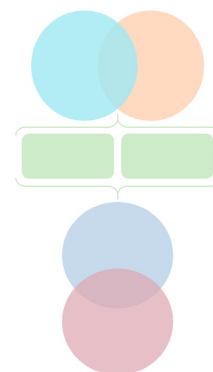
None of the management practices described here are new, but our research suggests that they are all becoming more important. Companies that do not master these practices are likely to struggle as they attempt to build the technology resources they need to become agile and innovative. As a result, they will struggle to deliver the kind of customer engagement and digitized solutions necessary to succeed in the digital economy.

RECOMMENDATIONS

Based on our research findings, we believe that leaders should take a number of steps to facilitate their companies' digital business transformations:

1. Define a vision for a personalized customer engagement strategy or an integrated digitized solutions strategy that will distinguish your company from competitors and build customer loyalty. This vision will ultimately affect both your products and services and go-to-market approaches, so track how you are performing in those areas relative to your competitors. But know from the start which strategy is more important to you.
2. Identify critical deficiencies in your operational backbone and develop a plan of attack to address them. To accelerate implementation of the backbone, you may need to work with either SaaS or business processing outsourcing partners.
3. Establish key parameters for your digital services platform—the critical services to be offered, how they will be accessed, and by whom (the internal and external parties). Study other companies' developer platforms to imagine your high-level architecture.
4. Create a small set of metrics to allow you to track agility and innovativeness. (As a reminder, top performers in our survey produced about a third of new digital products and services from reuse, and derived about a third of their revenues from new products and services introduced in the last two years.) You want to ensure that individuals throughout the company are learning quickly and reusing services where appropriate.
5. Ensure that everyone understands the importance of architecture and how to effectively apply architectural principles.
6. Define and introduce a small set of business services for either internal or external parties to use regularly (e.g., payments in a financial services company, invoicing in a distribution company). Assign one person the responsibility for the functionality, quality, cost, and internal and external marketing of that service. Gradually build a growing portfolio of services (and smaller microservices within those services, as appropriate).
7. Insist on cross-functional participation—and fast iteration—on all new business change projects. Start small but go fast!

These seven recommendations form the action items from the MIT CISR/BCG research on Designing Digital Organizations. We continue to study how established companies can successfully transform for digital success and will distribute additional research findings as they become available.



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