



Research Insights

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# Three electronics industry strategies for the new data economy

Powering up  
platforms, tech stacks,  
and rapid innovation

IBM Institute for  
Business Value





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## Talking points

### **Hardware still drives interactions but risks being marginalized**

There's growing concern about how the role of electronics will evolve. Electronics companies must move closer to the data, insights, interactions, and content streams to own the customer relationship.

### **Electronics executives can foster change across their ecosystems**

Many companies are turning to innovation centers that co-locate design and technology talent to optimize effectiveness. Often called "garages," these centers support innovation development and delivery across an electronics ecosystem.

### **Electronics companies are betting on platforms**

The technical platform is becoming an equal partner in success with business platforms. If platforms are the means to enable an exchange of value between participants, then platforms are the "what" and the tech stack is the "how."

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## Introduction

In late 2018, the IBM Institute for Business Value asked 70 electronics executives across the globe about the current state of the industry and where it's going over the next three years. Their responses make two key points as clear as the glass on a premium-priced television: 1) Enduring technological advancements will continue to spark rapid change. 2) While technological change creates challenges, it also provides solutions.

Point one: Sixty-one percent of the executives we interviewed say technology is moving fast and that speed is accelerating the overall pace of change. And an eye-popping 97 percent agree this will be true in 2022.<sup>1</sup> While there's an implicit understanding that electronics will be a dominant interaction point for users and technology for years to come, there's a growing unease about how their role will evolve. Each time a user commands a device on the countertop to "add rice" to a shopping list, there's a risk: Will electronics become the "dumb display" in the middle? While these might be harsh words, the question remains. How can the industry move closer to the data, insights, interactions, and content streams that users value so dearly?

Finding the answer to that question leads us to point number two: While technology is part of the issue, it's also part of the solution. Industry executives are increasingly integrating next-generation technology into their enterprise and customer service operations. More than half of the electronics executives we interviewed say their companies are currently reinventing their operations with technologies like blockchain, IoT, multicloud integration, and robotic process automation (RPA).



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# >80%

of electronics executives expect their organizations to reinvent operations using technologies like blockchain, IoT, multicloud integration, and robotic processes automation (RPA) by 2022.



# 60%

of electronics executives have added RPA to their list of must-have technologies they intend to acquire in the next 36 months.

More than 80 percent expect their organizations to be using these technologies by 2022 (see Figure 1). Instead of simply building smarter devices, the industry is turning to technology to drive new types of customer experiences and customer-centric business models, transitioning away from hardware-only models.

Electronics executives now see that hardware is only the tip of the arrow into multiple potential revenue streams. Each device interaction can be data- and insight-rich, and the growing volume of interactions offer massive machine learning potential. Each time someone speaks to or interacts with a machine, there is an opportunity to gather and build knowledge. Currently, many electronics companies are missing out on that growing knowledge base – and the insights that can lead to potential new revenue models.

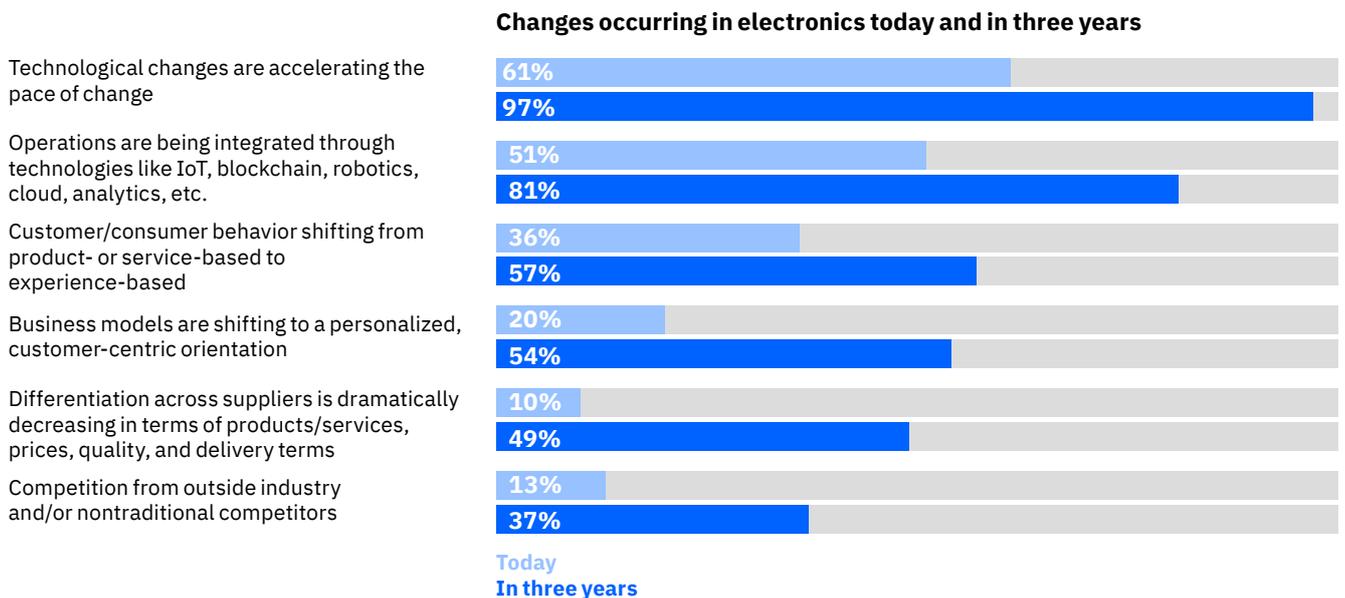
The data economy and its associated platforms represent a bridge to increased value. As we noted in a prior report, “The platform advantage in electronics: How ‘asset-light’ organizations can thrive in the new data economy,” a focus on industry-developed platforms represents an inversion of industry strategy – focusing less on devices and more on solutions.<sup>2</sup> Our analysis indicates that three strategic priorities are key to shifting electronics companies into the data economy and platforms that support it:

1. Create a platform-centric “tech stack” that is AI-centered and robotically inclined.
2. Embrace design thinking to translate deep customer knowledge into better products and services.
3. Develop innovation pipelines that deliver more quickly through multidisciplinary teams.

Each device interaction offers an opportunity to collect data and insights.

**Figure 1**

Executives express a decisive view on how the electronics industry is changing



Source: Winning Strategies Research unpublished data. IBM Institute for Business Value. September 2018.

These strategies enable the design of pleasing, user-oriented, and insightful interactions for customers – and make it easier to enhance these interactions through apps, accessories, and add-ons. These strategies help drive sustainable value and revenue streams that connect device and customer, making it harder to disintermediate devices. They enable improved reuse and modularity. As our survey reveals, electronics executives agree that rapid technological advances will continue, driving the overall pace of change. The issue at hand is how quickly these executives can shift their focus and claim their stake in the data economy.

## Strategy 1 Create a platform-centric “tech stack” that is AI-centered and robotically inclined

Executives surveyed agree that platforms are important or are growing in importance.<sup>3</sup> However, that doesn’t necessarily mean the industry has them all figured out. Platforms can evolve in a variety of directions, three of which are highly relevant for electronics companies:

- *Business platforms*, where data, workflows, and expertise drive competitive advantage
- *Technology platforms – aka the “tech stack”* – that meld application and infrastructure into fluid workflows and support business platforms
- *Mass consumer platforms*, such as Alibaba, eBay, or Facebook, that focus on monetizing customer data through advertising or commerce.

Often referred to as the tech stack, the technical platform is becoming an equal partner in success with business and mass consumer platforms. So, if platforms are the means to enable an exchange of value between participants – developers, customers, product designers, data providers, and original equipment providers – then platforms are the “what” and the tech stack is the “how.” They work symbiotically.

There are three variants of business platforms. *Internal platforms* enable operational competitiveness. They make activities within the company more effective and efficient by using new technologies and skills. *Industry platforms* enhance the company’s relative market relevance and position by delivering key process capabilities on behalf of ecosystem partners and potentially competitors. Finally, *cross-market platforms* capture new and adjacent marketspace by managing essential or value-added processes on behalf of a broader ecosystem of partners.

### Business platform type

<b>Internal platforms</b>	These create an internal competency and competitive advantage. An example is a control tower for the supply chain that allows broad visibility and faster reaction times for a company with a diverse product set.
<b>Industry platforms</b>	These offer specific vertical or value-chain integration. An example is a manufacturing equipment solution (MES) for semiconductors.
<b>Cross-market platforms</b>	These specify and set parameters for an industry. An example is the Institute of Electrical and Electronics Engineers (IEEE) standards organization.

### “Tech stacking” for business agility and competitive advantage

Platforms are becoming an expression of organizational strategy. They increasingly reflect the content, data, and conceptual thinking the organization values and needs to make accessible across its ecosystem. By enabling this value exchange, platforms stimulate collaboration. This notion of an industry platform will help electronics companies rapidly bring new types of solutions to market with partners and on their own. Developers, makers, designers, manufacturers, data providers, and users can interact with data, parts, algorithms, technologies, facilities, machines, talent, and so forth.

In electronics, the tech stack pays off on the business platform’s promises. Each selection in the tech stack not only needs to work independently, but also needs to collaboratively support increased value and better performance. That’s where next-generation technologies come in.

Over the past few years, cloud computing (cloud) has become the de facto approach to application management and innovation.<sup>4</sup> Similarly, Internet of Things (IoT) sensors and data flows have shown explosive growth, and analytics are part of the baseline tech stack.<sup>5</sup>

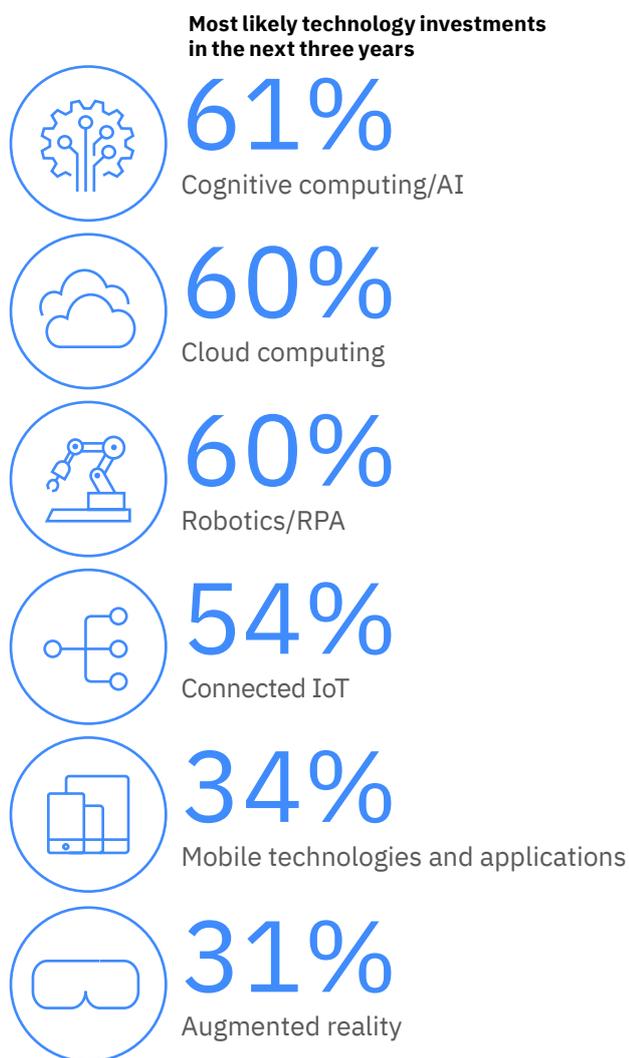
Looking forward three years, executives say they will continue investments in four key technologies that extract and act on the value of data: AI, cloud, robotics/RPA, and IoT. These are rounded out by smaller percentages who plan investments in mobile technologies and in augmented reality and blockchain (see Figure 2).<sup>6</sup> These technologies can integrate and operationalize business decisions and workflows. They help exploit the value of data and allow – almost “by design” – validation of business rules, accelerating processes and time to market. Embracing these technologies and examining where they deliver value and drive data economies, is key in determining the right investment strategy.

“Eighty percent of all the data created is dark, unstructured data – data that the computers we have developed in the last 40 years are not able to analyze efficiently.”

Dr. Alessandro Curioni, IBM Fellow, Vice President Europe and Director, IBM Research – Zurich Lab

**Figure 2**

The tech stack’s most wanted



Source: *Winning Strategies Research unpublished data. IBM Institute for Business Value. September 2018.*

### From cloud to multicloud

While cloud investments have been substantial over the past few years, recent investments lean distinctly toward multicloud management to increase business agility. Increasingly, enterprises want to modernize and transform existing applications simultaneously. For these tasks, one cloud solution can’t meet all the diverse needs, and multicloud provides a means to manage across them.

Multicloud provides enterprises with a modular and composable architecture for their many clouds, allowing companies to build on existing investments. It also brings public and private clouds together, allowing each cloud the computation processes it needs without the need for synchronization. This, in turn, increases flexibility while allowing the enterprise to address security, governance, and geographical issues.

### AI advances

AI has come into its own in the minds of executives. Electronics leaders recognize its pervasive benefits in customer analytics and recommendations (70 percent); cognitive and prescriptive analytics (63 percent); active asset monitoring with predictive quality management, logistics, and workflow optimization (60 percent); and cognitive assistants in connected products (47 percent).<sup>7</sup>

Two new notions are reshaping the value of AI in the tech stack: “dark data” and “broad AI.” Dark data is prevalent across organizations. It’s generated by computers and processes but is often neglected in decision making or insight generation (see Figure 3). Dr. Alessandro Curioni, IBM Research Fellow and vice president of IBM Research Europe, estimates that 80 percent of data today is “dark,” meaning there is plenty of value left to mine.

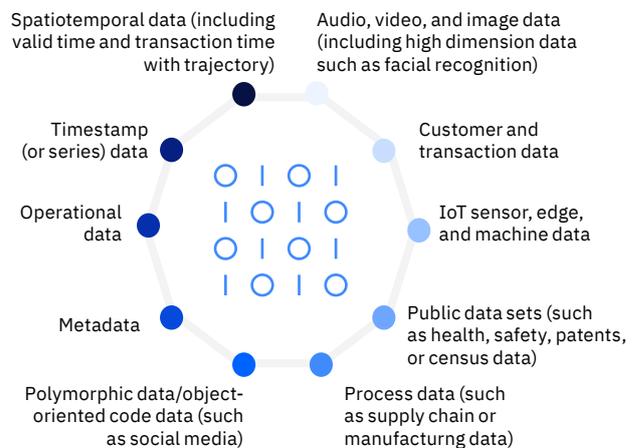
Dark data might be trapped in customer inquiry handling or a result of manufacturing changes made seamlessly by engineers but never documented. It might be sitting in warranty process decisions or spare parts handling. AI can help organizations extract value from dark data by parsing and reassembling information into insights humans can consume and use to speed decision making.

## OSRAM turns to multicloud to fulfill compliance demands<sup>8</sup>

OSRAM, a world-class lighting solutions provider, pursued a multicloud strategy to meet security and compliance needs. Due to German regulations, the company needed to store data in the country. OSRAM moved its ERP landscape from an on-premises environment to a managed service environment and moved non-ERP applications to managed services in just nine months. When it later determined an unmanaged service would be more aligned with its requirements, leaders decided to implement a multicloud strategy. The company was able to port non-ERP applications over to bare metal servers – a complex migration – in only six months and with less than a day of business downtime.

**Figure 3**

Data types: Seeing in the dark



Source: IBM Institute for Business Value analysis.

Broad AI has grown out of the middle ground in the AI continuum. On one end of that continuum is narrow AI or machine learning applied to one particular task, such as a recommendation engine or procurement pricing adjudication. Most current work in AI today is concentrated here. Although sophisticated uses of technology, these systems solve only one challenge at a time. These algorithms often require large training sets but can deliver high levels of confidence in their outputs.

At the other end of the continuum is artificial general intelligence (AGI). There has been much discussion about machines that are able to reason and act with autonomy across a vast swath of topics. AI is currently nowhere near the AGI threshold. However, broad AI brings domain or industry knowledge across multiple topics together. Consider the supply chain in electronics. Forecast and demand data related to multiple partners, multiple locations, and multiple products must be united effectively to solve problems and make recommendations. This is where broad AI plays – enabling industry experience and data to drive scale and automation. Broad AI allows much of the previously dark data to be consumable. And in this case, it also helps reduce training time, leading to faster time to market.

## Sixty percent of executives have added RPA to their list of must-have technologies that they intend to acquire in the next 36 months.

Executives recognize the potential of broad AI to address a host of challenges. According to our research, the top challenges electronics executives wish to address reflect the top and the bottom line: personalization for customer experiences at 56 percent and improving asset utilization at 51 percent. Just under 50 percent of electronics executives also cite optimization of business processes, generating new insights into customer needs, and identification of new revenue opportunities (see Figure 4).<sup>9</sup>

### RPA: A new force for speed and agility

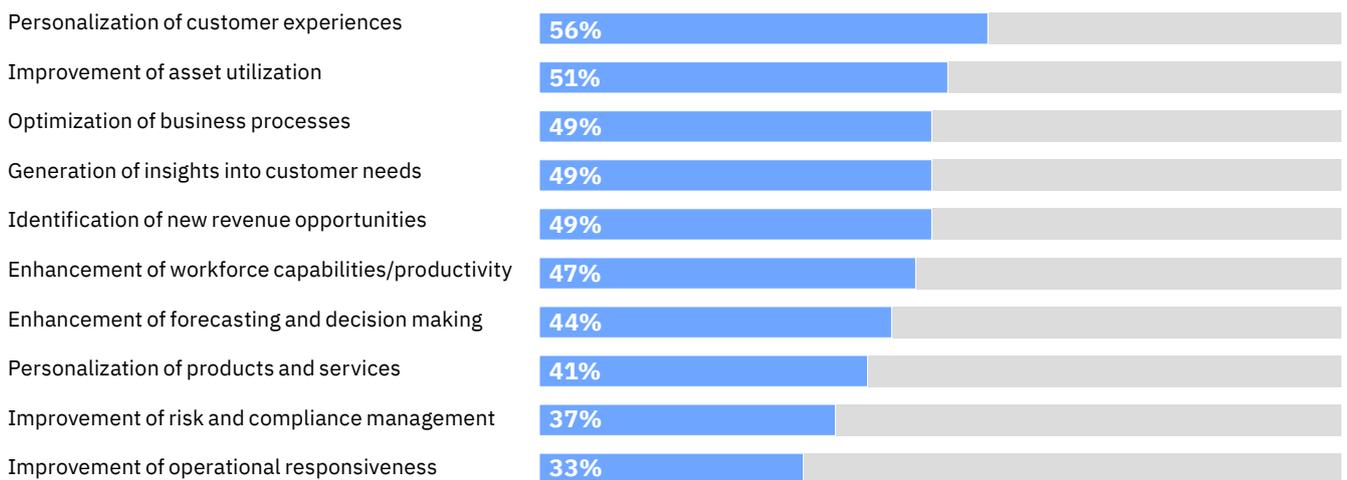
Workflow automation in the past was complex, requiring specialized skills and applications. In contrast, RPA examines user interactions and targets processes to automate and streamline. It traverses applications, marrying rules and actions to seamlessly execute work across systems.

For instance, consider the process of checking on a customer email inquiry. Traditionally, this task would require customer support personnel to work across applications. However, RPA can rapidly query all the necessary systems and bring one answer back. It can also find data mismatches – if someone mistakenly entered a part that already exists in the system as a new entry, for example. RPA can highlight problem areas in test logs in minutes – a task that would otherwise require hours of review. That’s why 60 percent of executives have added RPA to their list of must-have technologies that they intend to acquire in the next 36 months.<sup>10</sup>

More than two-thirds of electronics executives want to apply RPA to improve customer experience, improve decision making, and enhance reliability and predictability. And more than 60 percent seek to improve data analysis and staff safety and well-being.<sup>11</sup>

**Figure 4**

The challenges executives want to address using AI



Source: *Winning Strategies Research unpublished data. IBM Institute for Business Value. September 2018.*

## New tech, new tricks

Blockchain, 3D printing, edge technology, augmented reality, and guided vehicles (such as drones or forklifts) are now emerging parts of the tech stack. While not as widely adopted as other technologies, they present new opportunities.

Technology	Application areas
<b>Augmented reality</b>	Places where a live picture is worth a thousand words: repair, design, and education
<b>3D printing</b>	Speed and replication, one offs: Prototyping and local needs for spare or expired parts
<b>Blockchain</b>	Places where multi-party identification, traceability, and trust are needed: Anti-counterfeiting, materials content declarations, responsible sourcing, and “know your supplier”
<b>Edge</b>	Extreme low latency and precision processing at pinpoint locations: Surgical/medical devices (robotics), power grid equipment, and autonomous cars
<b>Guided vehicles</b>	Gains in speed and efficiency: Large manufacturing facilities, warehousing, and item pickup or delivery

Blockchain in particular is gaining traction as more executives come to understand its benefits. For example, Emerson is a member of the Food Trust blockchain. The company’s cold chain technology helps provide and track temperature information throughout the food transport process.<sup>12</sup> Another example is Seagate. The company is melding a blockchain platform with proprietary technology to reduce global hard drive counterfeiting. Seagate can update the blockchain with product authentication data using its Seagate Secure™ Electronic ID (eID) electronic fingerprinting technology at the point of manufacture. In addition, Seagate’s Certified Erase can employ cryptographic erasure technology to produce a digital certificate of data purge, which is electronically signed by the device under the Seagate Secure public key infrastructure (PKI) and stored on the blockchain for compliance management.<sup>13</sup>

## Taking action

*Determine where your ecosystem and competitive advantages come together*

The point of a platform is to exploit competitive advantage across a broader universe of participants – both inside and outside the organization. While executives have a definite opinion on how and where they’d like to participate, sometimes beginning is half the battle.

Opening up data, code snippets, and software development kits to trusted partners or even the market at large allows broader participation and drives reductions in development time. Additionally, participating in open development communities can allow new technologies with tested functionality to be incorporated more quickly. As noted in our report “The platform advantage in electronics,” the expense and challenges of developing a unique platform with dedicated advantages may take resources that would be better spent gaining experience.<sup>14</sup> Determine how you want to participate and get in the game early.

*Build your new tech stack*

Given cloud proliferation, it’s time to get your clouds in order. A multicloud strategy is critical. Increasing the value of data in one domain has limited use. Clouds should be interoperable and enable data to be consumed and transformed in multiple places to gain the benefits of modularity.

## RPA can tackle routine tasks, freeing employees to focus on more complicated ones.

Moving from narrow to broad AI enables electronics companies to deliver industry expertise to their customers. AI can find deeper insights across data sets and deliver specific benefits that optimize forecasting, production, marketing, and supply chains. It can enhance human and asset productivity, combining data in new ways that narrow AI cannot. Look beyond basic use cases.

RPA can tackle routine tasks, freeing employees to focus on more complicated ones. For instance, if your systems could speed new product test designs or release spare parts without human intervention, then employees would have more time to achieve higher-value outcomes.

It's important to assess where process efficiencies and scale can add value to the customer experience or remove cost. RPA can help sort and handle basic customer inquiries and flag anomalous transactions to reduce fraud. And blockchain can help remove business friction by improving targeting (identifying items subject to recall, for example). It can also help build and increase trust by speeding materials declarations and validating authenticity.

With each technology, the focus should be on use cases that provide proof of value – not proof of technology. These technologies are no longer nascent. There are proven success stories across industries and enterprises. Thus, the focus should be on the specific value the technology can provide your organization. Select use cases that clearly demonstrate the business value.

When determining the business case, executives should consider the amount of detail needed to gain approvals. Is a rough sketch of benefits appropriate, or does the enterprise require detailed benchmarks? Sometimes a rough order of magnitude will suffice, while in other cases, a comprehensive case is needed for funding and scale. The latter requires detailed enterprise benchmarks, which can often be provided by a trusted partner with expertise in the process you want to transform.

## Strategy 2

### Embrace design thinking to translate deep customer knowledge into better products and services

If executives need proof that design thinking has deep technical application, they need look no further than leading academic institutions such as the Massachusetts Institute of Technology (MIT) and Stanford University. Both feature multiple classes on this technique in their curricula.<sup>15</sup> Why? Traditional mechanisms of product design aren't doing the job in an era where experience is vitally important. In addition, design thinking can help enterprises extract more value from technology investments.

#### **Design thinking: The path to customer heads and hearts**

Well-designed, flexible, and open tech stacks and business platforms support the design thinking methodology with improved insights, technology, and data for their applications. That translates to shorter and more effective design cycles that can deliver better products. Following are two examples of the impact design thinking can have:<sup>16</sup>

- A minor project built by a single team in over 40 weeks expects USD 2 million in profits. Design thinking practices reduced time-to-completion to only 20 weeks.
- A major project is typically built by two teams over 100 weeks and expects USD 4 million in profits. Design thinking practices cut time-to-completion to only 50 weeks.

## Design thinking starts by addressing the user rather than the project.

Figure 5 goes into more detail, showing how design thinking can impact design and development timelines, design defects, and cost savings for two different types of projects. While such benefits might seem exceptional, they're actually the norm.

Design thinking starts by addressing the user rather than the project: What do users say or need to say to others? How do they express themselves? It defines expectations and reactions: What do they think about the current situation? What is their worldview? It identifies actions: What do they need to do to get their job done? It establishes values: How does this person feel about his or her job? Features and functions don't address these fundamental, experiential questions. (See sidebar: *Meet Clarice.*)

Deep industry experience must be coupled with a focus on getting to market quickly. For instance, a major manufacturer scheduled software updates every six months. When the company queried its users, it learned they were expecting updates every month to ensure they had the latest and greatest functionality. For basic software, designing for the majority is the norm. However, in the applications world, designing for core users means getting more concrete about the customer and increasing organizational agility to deliver.

For instance, when Medtronic set out to design its Sugar.IQ app, it had to move to a new level of personalization. The Sugar.IQ assistant leverages AI capabilities to continuously analyze patterns that can affect diabetic blood sugar. Medtronic added a glycemic assist feature

### Figure 5

Actual benefits in the product development cycle for a minor and major design project using design thinking (listed by phase)

Project phase	Initial design and alignment	Development and testing time	Project design defects
<b>Benefit</b>	Time required reduced by 75 percent	Time required reduced by 33 percent	Defects reduced by 50 percent, saving rework
<b>Minor project cost savings</b>	USD 196,000	USD 223,000	USD 77,000
<b>Major project cost savings</b>	USD 872,000	USD 1.1 million	USD 153,000

that allows users to see how they respond to challenging foods and tweak their regimen. The application also searches for and shares hidden reasons for blood sugar highs and lows. It examines what activities could affect glycemic levels for the individual user, offering personalized information. It also shows a personalized daily summary of glucose trends, so users can know how they're doing in the moment and overall.<sup>17</sup>

### Taking action

*Get started: Build your design thinking beachhead*  
Multiple sources offer design thinking classes and resources for electronics companies as they learn the ropes. We suggest beginning with a few small projects or just one. Design thinking is a modest investment, but there are both design and technology resources for each project. While design resources are likely dedicated to a specific project, technologists might work across projects. So, leverage them effectively and manage potential downtime in one project across other ones.

When choosing a design thinking partner, choose one with proven successes. Vet team resources for specific understanding of the types of projects you plan to tackle and their experience with the industry, design thinking methodology, and technology. Specifically focus on how their understanding of all types of data and user context can build competitive advantages.

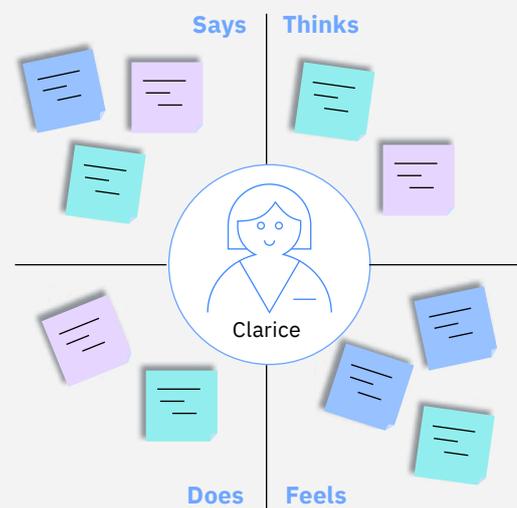
*Workshop your way to better initial concepts*  
Use facilitated design thinking workshops to gather diverse perspectives and empower participants to make decisions. Choose participants who understand the ultimate users of the application or tools you want to create. Use these workshops to develop an accelerated vision of the outcomes. And supplement that with user research and “sponsor users” who can provide feedback.

Also, select the core project team you'll keep together during the full run of the project and identify milestones that focus on specific functionality. In addition, hold playbacks, which are sessions that bring stakeholders into the loop to exchange feedback.

## Meet Clarice

Clarice is an engineer. She's 28, and has 5 years of experience out of a university. She's managing a team of 5 production technicians at a facility in Shanghai, creating new optics solutions. She's been in her role for 4 months and finds it challenging. How can a team design for her?

- She needs not only to see the metrics but also to have performance recommendations.
- She needs to understand the jargon the line techs speak to gain their respect.
- She needs to take action quickly when there's a problem on the line.
- She wants to do well and succeed for her company and her family.



The design team must understand Clarice and her wants, needs, and aspirations – related specifically to her issues – to actively address a solution for her and those like her. It's also important to assemble the right team to solve her problem – in this case, a team that understands how to manufacture optics, the potential difficulties encountered, and how a new manager can effectively communicate with her team.

## To foster change, many companies are turning to innovation centers – or garages – that co-locate design and technology talent.

### *Remove barriers*

While design thinking helps improve customer satisfaction and identification of business priorities, it also embeds collaboration and trust into the process. You're likely to encounter resistance to change. Product, service, technology, and data design professionals working together might not be the norm, so it's important to stress potential benefits – such as a decrease in redundancy and faster speed to market.

To build adoption, executives should champion this change as much as they would other corporate initiatives. Consider framing this change the same way you would a design for a serviceability or reliability initiative and clarify that the overall objective is enabling long-term revenue and customer engagement.

### *Establish governance with extended ecosystems*

Governance is challenging, but it's also necessary to help ensure effective, efficient applications, especially as you increasingly invite partners into the process. Security is a key consideration. How often and where will someone interact with the applications? Build safeguards to create a safe and secure environment for data, transactions, and interactions. Think through and determine service level agreements (SLAs) and terms of service (ToS) early in the process.

## Investment area 3

### Develop innovation pipelines that deliver more quickly through multidisciplinary teams

These changes around technology, data curiosity, and developing applications are not trivial for an organization. The vast majority of electronics C-suite executives surveyed say they are equipped to handle the changes coming their way – both today and in the next 36 months. However, only 9 percent report that their employees are ready today, and less than half say their employees will be ready in three years. Executives perceive the situation to be worse with business partners, saying only 19 percent will be ready in three years.<sup>18</sup> Thus, it's not surprising that

electronics executives cite employee resistance (51 percent) and inadequate skills and relevant personnel to execute (50 percent) as top challenges in AI adoption.<sup>19</sup>

To foster change, many companies are turning to innovation centers that co-locate design and technology talent to optimize effectiveness. Some of these centers are referred to as “garages,” supporting the Silicon Valley tradition of the garage as a space for invention.<sup>20</sup>

### **Innovation central: Garages for modular, scalable value**

For electronics companies, the goal of an innovation center – or garage – is to turn data and insights into superior functionality for the user as quickly as possible. Whatever the project involves – from new product development to application and user interface design – a garage should support an integrated approach to innovation development and delivery across an electronics ecosystem.

Doing that requires experts in multiple disciplines who are not just available to each other, but who can collaborate on the fly, meet with immediacy, and move from theory to practice in hours or days – not weeks or months. The garages of today are designed to help rapidly move from design to prototype to scale, facilitating continuous innovation for the organization. They don't just bring hardware and apps to life, they help extend user loyalty and interaction over the duration of ownership, harnessing the combined value of devices, data, and context.

Garages bring together resources who can deliver and have a flexible nature – allowing expertise to come and go as needed. They focus on a t-shape for talent, with a breadth of knowledge forming the horizontal bar and deep expertise forming the vertical one. These agile development teams leverage “scrum,” a framework that allows teams to self-organize, learn through experience, make changes quickly, and continuously learn. The process is facilitated by a scrum master.

Garages are designed for access and iteration. They marry development talent with industry and technology knowledge. For instance, a garage team developing a blockchain approach for a “know your supplier” app would require resources with knowledge of blockchain, data security, and cybersecurity. It also would require talent with financial expertise and industry supply experts who know the data, typical partnering relationships, partner qualifications, and more.

Garages can deliver value quickly thanks to both their processes and their people. Garages leverage the three Cs: *Co-create*, *co-execute*, *co-operate* (see Figure 6). During the co-create phase, team members define a business initiative or drive new insights into an existing idea. They rely on proofs of concept and user testing to envision the future and prioritize initiatives. This research and prototyping phase concludes with a funding gate, allowing future work.

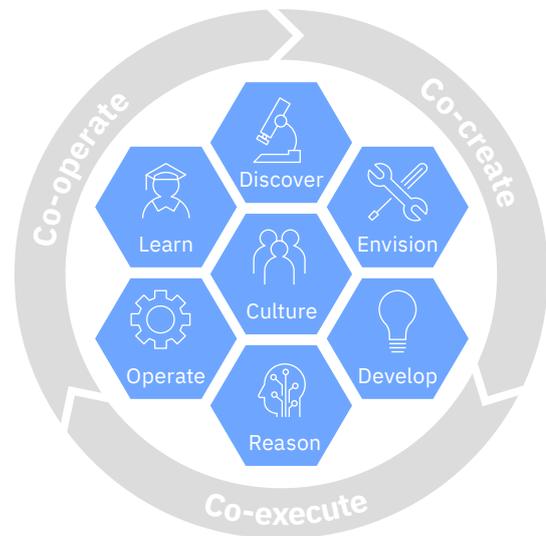
During the co-execute phase, initiative hypotheses are tested using end-user feedback through sponsor users. The resulting information is used to build minimum viable products (MVPs) that prove product/market fit. This phase ends with a stage gate that assesses and funds only applications with a strong fit for the product and market. Finally, the co-operate phase is about scaling and optimizing to enable planning and deployment.

### Apps: Making users happy one step at a time

Apps work best when they are purposed for specific users. Ideally, they are designed to help orient the platform, data, and device around the user with appropriate security and governance. They’re also very modular in nature.

There’s a notion in app development of building complete apps that can continuously expand. However, each part of the app must be complete. For instance, the first iteration of an app might only have one key function – but that function meets the user’s need. Given its simplicity, you could think of it as a skateboard. Adding more function to that app doesn’t equate adding a second skateboard.

**Figure 6**  
The garage model



**Co-create the future.** Define a business initiative or drive new insights into an existing idea.

**Co-execute with agility.** Pilot your MVP or build a series of MVPs to test in the market.

**Co-operate to deliver at scale.** Scale your MVP in market and increase market value.

Source: IBM Garage.

Rather, it requires upgrading the entire experience to resemble, perhaps, a bicycle. In the last iteration, the app is further upgraded to provide an even richer experience and – using our analogy – it now resembles a car. Companies should avoid the mistake of trying to design the car in the first iteration. That would involve a lot of effort but no opportunity to validate user need and make changes. To use another analogy: Don’t boil the ocean in app design.

Instead, garage resources offer more functionality on one hand and more industry expertise on the other, which can be combined to more agilely deliver. When data and functionality exist on the platform, they can be combined with ease as they are normalized for that use. As an example, consider the design of three apps from a set of core functionality or data (see Figure 7). The first app might drive spare parts management and the location of service centers. The second iteration might be an upgrade that adds weather data to handle or even avoid potential disruptions in part supply. The third app might be designed for consumers and retailers of the company, using blockchain to register customers and inform warranty claims.

Garages concentrate innovation talent across the organization – and potentially across the ecosystem – to improve speed to market. Companies are increasingly evaluating open arrangements that allow partners a more active role in the garage, spreading the cultural and speed advantages across the industry more rapidly.

### Taking action

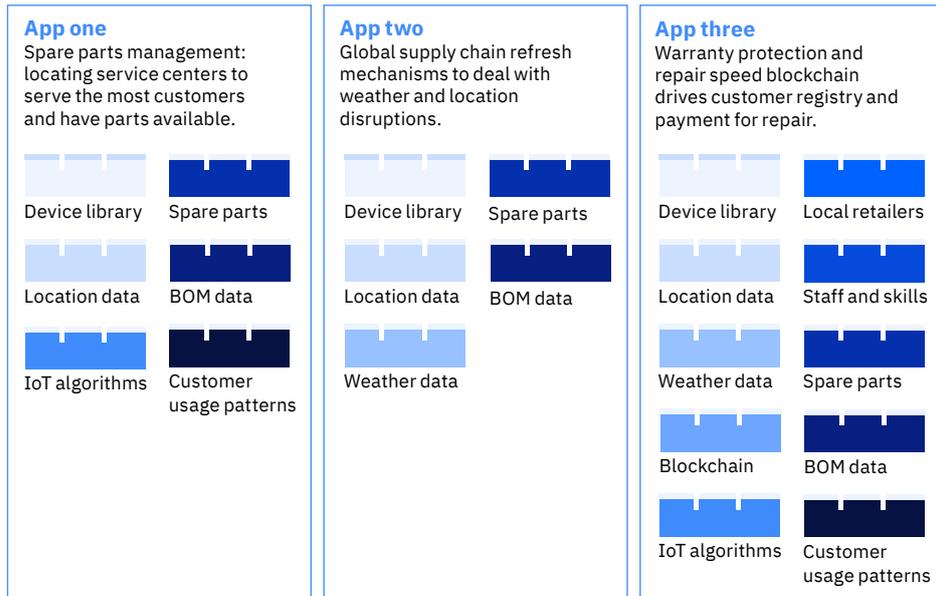
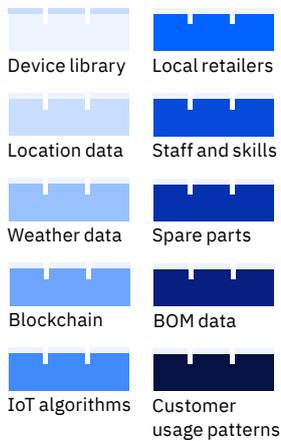
#### Start with one garage

Create a pilot garage with resources that cover product and software design, strategy, UX, creatives, tech expertise, and development. Be sure to include team members who are well versed across the tech stack, cloud, AI, IoT, edge, 5G analytics, blockchain, and other appropriate areas. Wherever possible, consider co-location to accelerate progress. Last, don't be afraid to enable experimentation and fast failure. It's better to know what's working and what's not. It's the surest route to success on the next time out.

**Figure 7**

Modular design of apps

When these exist on the platform, they are easy to combine for developers from the enterprise and the ecosystems



Source: IBM Institute for Business Value analysis.

## Don't be afraid to enable experimentation and fast failure in the garage environment.

### *Pair app developers and business resources to focus on value – not cool features*

A garage is structured to harness the power of design thinking, putting the focus on what the user values. The garage team starts at the very beginning of product design, working alongside more traditional product development teams. No team works in a vacuum. While the garage team offers industry and technological expertise, the business resources bring market understanding, sponsor users, and an understanding of what happens to devices and machines “in the wild.”

### *Release early and often*

Continuous releases are better than waiting for perfection – feedback loops are essential. Apply what you know; then engage users and validate early and often. It's not a crime to stay in beta mode. In fact, testing new data, features, and functions with users is important. Development sprints followed by well-monitored releases help identify bugs and breaks more quickly. As long as appropriate security is rock solid, customers can be useful in finding things developers might overlook.

### *Build out your ecosystem*

We suggest starting with your ecosystem. Getting ecosystem participants onboard as partners in success can help reduce the risk of failure (just be sure to establish appropriate governance). Consider user communities and forums to allow participants to self-serve and contribute ideas regularly to development pipelines. Prioritize development and innovation through garages.

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## Key questions to consider

- How will you approach each strategy to maximize your organization's potential in the data economy?
- What projects can you move into a garage approach to enable continuous and agile innovation in your organization?
- How will your tech stack and platforms work collaboratively to incorporate new technology and increase competitive differentiation?

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## For more information

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