

e B O O K

The Top 7 Tech Trends for 2021

Making the case for modernization



Introduction: Lucky number 7

Obviously, the pandemic made a big difference in IT and technology in 2020 as digital transformation went into hyperdrive. Late in 2020, all kinds of technology experts and analysts made their annual predictions about technology. Mulesoft's list of the [top tech trends for 2021](#) was one of many that reflected the natural progression from pivoting rapidly due to lockdowns and masks to determining how to move business forward.¹

While culling through all the predictions, we at TmaxSoft came up with our own top 7 tech trends for 2021. We also saw a common thread—these trends were not only products of turbocharged digital transformation, but they were also critical for any business that wants to thrive in a post-pandemic world. After all, you can only go forward in technology; you cannot go back. The companies that have already adopted some or all of these trends will not go return to the old ways—this is the new technology world order—and you, too, should consider the advantages each will bring.

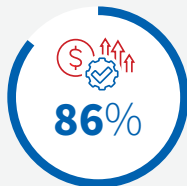
These trends have another thing in common: They are not compatible with legacy infrastructures and databases, aging mainframes, and decades-old business applications. From delivering frictionless experiences to RPA to microservices, to derive the most value from these trends, you need the cloud, a flexible, modern database, and an infrastructure for developing modern apps.

This eBook shares the TmaxSoft top 7 trends for 2021 and shows why modernization is the key to embedding them into your technology landscape.

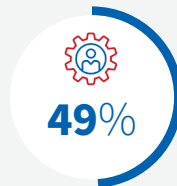
¹ Vala Afshar, "Top 8 trends shaping digital transformation in 2021." 2020. ZDNet, 7 Dec.

Trend 1: Customer (multi)experience

Did you know that **86% of buyers** will pay a higher price for a product or service if they have a great customer experience or that **49% of buyers** who receive a personalized experience made impulse buys?² It's no wonder, then, that a **recent Forrester survey** concluded that **88% of IT decision-makers** believe that CX will be their competitive differentiator and advantage in 2021.³



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Throughout the pandemic, customers have become more dependent on their devices, using them to order grocery deliveries, choose paint colors, learn a new competency, and so on. Companies that obsess over delivering the best customer experience (CX) on all digital platforms—aka customer multiexperience—will be 2021's winners.

So, what is CX, exactly? Hundreds of different definitions of customer experience are out on the web. [Smarter CX](#) has one

that is easy to understand: "CX is the creation of memorable and personal interactions so that customers want to spend more time with a particular company."⁴ These interactions deliver a [multi-experience journey](#),⁵ whereby customers can engage with the company multiple ways, such as on mobile apps, in social media, in a web or text chat, in a store, thru a QR code, and more.



² Toma Kulbyté, "37 customer experience statistics you need to know for 2021," 2021. SuperOffice, 24 Mar.
³ David Dodd, "The State of Customer Experience in 2019," 2019. *Business to Community*, 22 May.
⁴ David Balaban, "15 Definitions of Customer Experience," 2020. *Smarter CX*, 7 Feb.
⁵ Mariana Henriques, "From Omnichannel to Multiexperience: Continuously Evolving the Customer Journeys of the Future," 2020. *Perspectives*, 3 Apr.



Creating a CX journey that increases engagement and sales

Creating a journey that includes most or all these interactions is no small feat. A mobile app that is easy to use is often at the heart of it, but you will lose customers if it does not integrate with and behave the same as an ecommerce website or if a customer can't ask questions immediately in a chat, for example. [According to Gartner](#), to deliver the ultimate CX journey, you need scalable development of fit-for-purpose apps that span all the way customers engage—including custom mobile apps, responsive web and PWAs, immersive, and conversational app support.⁶

Gartner's definition only includes one aspect of delivering CX—how to build applications that make it easy for customers to do business with you or contact you with questions and concerns. It takes more than a snazzy development platform to make sure customers have personal and memorable interactions with your business. Those applications need to connect with your business systems quickly and easily. Therefore, your CX strategy will go nowhere without a modern and agile infrastructure.



Cloud migration and legacy modernization deliver CX

Yet, many companies are still using legacy systems to run their business. These systems are often hard-wired, have monolithic architectures that are difficult to change, and are difficult, if not impossible, to integrate with modern technologies. They struggle to work with real-time information and, in some dramatic cases, can't provide electronic output. Then there's legacy code. It is often a black box, so trying to integrate it with more modern code can bust your IT budget and exhaust your resources.

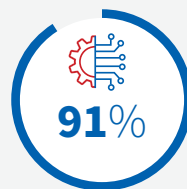
The cloud offers the elasticity, reliability, and scalability needed for customer experiences that enable your company to stand out in the competitive crowd. Migrating applications to the cloud with a legacy modernization platform and modern database management is one of the fastest ways improve all the ways your customers engage with your company—without starting from scratch. No workload or application is left behind, and any future applications built in the new infrastructure can use legacy data that is easily accessed.

Trend 2: Unprecedented Data Integration

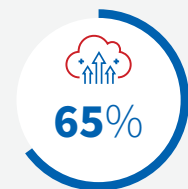
To keep pace with the explosion of digital solutions to analog problems, faster ways to unlock data and gain insights are critical. Consider these facts from a Forbes article last year. Over 80% of enterprise business operations leaders say data integration is critical to ongoing operations. In fact, 67% of enterprises were relying on data integration to support analytics and BI platforms in 2020, and 24% are planning to in the next 12 months. And 65% of organizations prefer to deploy data integration solutions from cloud platforms or hybrid cloud.⁷



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⁶ Gartner Peer Insights, "Multiexperience Development Platforms (MXDP) Reviews and Ratings," 2021.
⁷ Louis Columbus, "The State of Data Integration," 2020. *Forbes*, 29 Mar.



In 2021, data will help separate you from your competitors and delights customers. When a patient opens an application to schedule a doctor's visit and sign up for a virtual waiting room, that app has to integrate with not just the patient's data, but also the clinic's scheduling data.



No room for lock-in

When someone is ordering a gift basket for a friend, data integration is how the order and payment get where they need to be and a delivery is scheduled. That's why pulling data out of silos, and aggregating, analyzing, and acting on it must be your company's lifeline in these uncertain times. Unfortunately, unless your company was born in the cloud and runs on the latest cloud databases, database vendor lock-in makes the new breed of data integration and storage—such as data lakes and cloud data warehouses—difficult, if not impossible.

It can be an ordeal to unlock critical insights from monolithic databases, and their management systems struggle keep up with big data and analytics workloads. The result is an adverse effect on performance, stability, and reliability—the three key cornerstones to a successful digital business or transformation strategy. For example, imagine that your company has decided to implement a modern, cloud customer relationship system (CRM) that can be accessed from different devices and platforms. If your database is slow to update and hard to reach, you won't get the benefits of that CRM.



Manage your data from the cloud

Wringing every drop of value from your data while making sure it goes wherever it's needed to meet business needs and satisfy customers requires a change in mindset. You need to get your head into the cloud (and not out of it). The cloud offers the elasticity, reliability, and scalability needed for the data integration and analytics that drives digital business, workplaces, social interactions, and healthcare. Only the cloud can deliver the fast access to data for the business, edge computing, and AI.

To get set up on the cloud to make the most of your data, modernization is the name of the game. The combination of a legacy modernization platform and a modern RDBMS makes it easy to integrate data and modern applications in the cloud—without starting from scratch. It is a sensible choice for managing and accessing data. No workload or application is left behind, and your organization can build modern applications in the new infrastructure that take advantage of easy data access and integration.

Trend 3: Digital culture domination

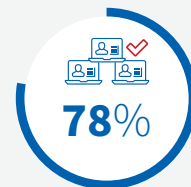
This year, much of the business workforce is still remote, and enterprises have reevaluated and changed processes to ensure that productivity levels stay the same, and employees remain safe. This may not be temporary. When Gartner asked company leaders what their post-pandemic work-from-home plans were, 80% said that they would allow employees to work remotely at least part of the time after the pandemic, and 47% of those leaders said that they would permit employees to work from home full-time. A PwC survey of 669 CEOs found that 78% believe remote collaboration is here to stay for the long-term.⁸



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of company leaders say they will allow employees to work remotely full-time post-pandemic



of CEOs believe remote collaboration is here to stay long-term

It's not all about work from home, however. Many onsite client visits, trade shows, and big tech events remain virtual. Companies are in new territory, trying to build and nurture digital cultures that rely on technology to meet customer demands and get work done.



What is a digital culture?

In a digital culture, services have been digitized and scaled to meet the needs of a partial or complete remote workforce. It operates around a set of values and practices that enable high performance in service of innovation and execution in a digitally enabled business environment. In short, a digital culture supports the always-on workforce and virtual events with intuitive consumer-grade apps that connect to data from multiple tools and systems, delivering critical customer information or operations insights and enabling employees to engage seamlessly.

A digital workforce is often fueled by employee self-service portals and mobile apps that enable high productivity safely even when working conditions or workplace rules change unexpectedly. It offers automation that handles help questions or simple customer service interactions so employees can focus on urgent customer issues. And, it has completely mastered the delivery of virtual events for customers and prospects.

⁸ Emily Courtney, "Remote Work Statistics: Navigating the New Normal," 2020. FlexJobs, 21 Dec.



How to promote a digital culture

Providing employees with modern, easy-to-use, and high-performing apps does not have to be a complex, seemingly endless endeavor with lengthy downtime and lots of new app development. Sensible options are available, such as mainframe migration, legacy app modernization, and cloud database management. All offer what you need to move to the cloud while keeping confidential applications and data safe and secure.

Mainframe migration and legacy app modernization can create a new environment that provides the development and execution environment required by traditional mainframe programming technology. You gain the agility, reliability and scalability of an open, modern system on the cloud and the cost savings are substantial. This leaves more resources for building the innovative digital solutions that support a digital culture because legacy maintenance is significantly reduced. You can also replace your DBMS or RDBMS with a solution where data resides in an isolated database tier that supports industry-standard SQL databases and a database management system that delivers data your employees need.

Trend 4: Digital innovation

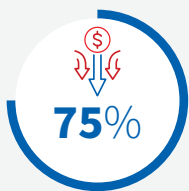
Necessity is the mother of invention. Having to ramp up digital transformation initiatives with the same or fewer IT resources and talent meant that IT had to lessen its grip on innovation and let the business in. Working together, these traditionally disparate units quickly spun up unique solutions to new problems and new demands. Expect to see more of the walls between the business and IT come tumbling down as IT empowers the business to self-serve and the business guides IT through tricky business problems to spur further digital innovation.



What is digital innovation?

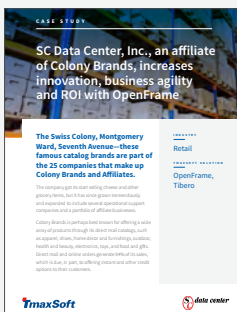
Digital innovation refers to the application of digital technology to existing and often analog business problems that changes the trajectory of a company in some way. It takes what is in your imagination, gives it shape and form, and then puts it out there for your customers, employees, and others.

Digital innovation rewrites the rulebook for business and delivers competitive advantage. There are poster children for digital innovation like Uber, Airbnb, Carvana, Doordash, and Instacart. But traditional companies are often just as successful at it. [Consider SC Data Center, Inc.](#), an affiliate of Colony Brands, which has been around for almost 100 years. SC Data Center, Inc., recently built a fully integrated automation solution to streamline customer data management and is currently in the process of developing modern applications to improve operations and customer engagement.⁹



Amount of annual cost reduction from the implementation of the OpenFrame automation solution by Consider SC Data Center, Inc.

Read the complete case study here.



Digital innovation is an inside-to-outside process. It involves automating internal operations, finding new ways to engage users, and offering new products and services to customers or users. At the heart of it all is the delivery of modern applications that make it easier for customers to interact with your business and purchase your products and services.

⁹ SC Data Center, Inc., an affiliate of Colony Brands, increases innovation, business agility and ROI with OpenFrame.™ TmaxSoft case study.



Fire up your legacy applications and data with modernization

Digital innovation is best delivered with a platform and infrastructure that enables your business units and IT to brainstorm and be creative. The last thing you need is for your IT resources to be bogged down by maintaining legacy apps or going around Robinhood's barn to access data. Those are the kind of tasks where digitally innovative dreams go to die. So, if you're serious about remaking, reimagining, or even starting a new digitally innovative business, your first step is shedding what is likely holding you back.

The cloud is where digital innovation happens. Therefore, you need a modern cloud infrastructure to create the strong foundation you need to deliver on your innovation ideas. Creating this modern infrastructure starts with moving existing applications and your RDBMS to a cloud-based environment with no reformatting, code changes or user impact. You gain the agility, reliability and scalability of an open, modern system on the cloud and the cost savings are substantial. This leaves more resources for building innovative digital solutions.

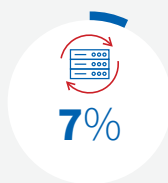
Trend 5: Composable enterprises

Responding to the pandemic and a large digital workforce has created a groundswell of applications. Building them all from scratch is no longer sustainable. Organizations are likely to shift to a composable enterprise model, whereby digital capabilities can be composed of existing applications using APIs, saving time and effort. Forrester and Gartner have both coined different aspects of this concept, which we believe will be prevalent in IT by the end of 2021.

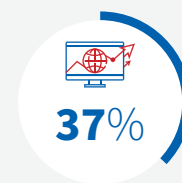


What is the composable enterprise?

[IDG reports](#) that as recently as 2018, 7% of organizations had fully implemented a digital-first approach to business. In addition, just 37% of organizations said they are fully capable of supporting a digital business strategy long-term.¹⁰ Then came 2020. Suddenly, your organizations and many others had to deliver personalization, connected digital experiences, on-demand everything, voice technology, artificial intelligence, and new business models at a pace once unthinkable.



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¹⁰ "State of Digital Business Transformation, 2018." IDG.

The pressure to deliver applications is not likely to abate; in fact, most experts agree that it will increase each year. The problem is that building each one from scratch is unsustainable. So, what can organizations feeling the pressure do? [Gartner](#) recommends the transformation into a composable enterprise, which they define as “an organization that can innovate and adapt to changing business needs through the assembly and combination of packaged business capabilities.”¹¹

The composable enterprise relies on a hyper selective technology acquisition approach, which is a 180-degree turn from the traditional method of choosing technology to increase efficiency from a select few preferred vendors and adding to it as new solutions are released. In this new model, companies pick and choose between a wide range of tools to stay ahead of competitors and satisfy clients. The business gets to compose architecture with IT through “as-a-service” subscriptions and cloud solutions.

Becoming a composable enterprise offers many benefits. It delivers a reliable IT infrastructure. You have flexible access to data and applications. Mindless, repetitive, and time-consuming tasks are eliminated by automation. Your DevOps and CapEx costs are lower. Best of all, digital transformation faster and less complex.



How to compose your enterprise

Composable enterprises require a flexible, scalable, and agile cloud infrastructure. And because important data and transactions reside in legacy application, it means finding a way to get them on that infrastructure. The last thing you need is to try to rewrite them in more modern languages or go through the complex task of developing APIs that connect to them.

The cloud is where composable enterprises live. Therefore, to become a composable enterprise, you start by moving existing applications, your RDBMS, and data to a cloud-based environment with no reformatting, code changes or user impact. Once in this environment, you can use some of the applications as-is, rearchitect others, and build new ones, all with an eye to composability. APIs available from different sources inside or outside IT can easily access data and connect it to new applications.



¹¹ Gartner, Inc. “Future of Applications: Delivering the Composable Enterprise.” February 11, 2020. Dennis Gaughan, Yefim Natis, Gene Alvarez, Mark O’Neill

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Trend 6: Automation like never before

Thanks to advances such as robotic process automation (RPA), machine learning, low-code/no-code, and modern application platforms, automation has really come into its own. It is driving operational efficiency, improving business processes, and transforming software development so that more people can build applications faster. This is the year that automation will become indispensable for scaling productivity and streamlining workflows.



A new frontier

A brave new automation frontier is taking last year's heightened automation to a whole new level, and savvy enterprises are already planning to stake out their territories. [Gartner predicts](#) a dramatic increase in the use of emerging automation technology in the next few years, such as:

- **IoB (Internet of Behavior):** The IoB is the use of sensors to track behavior, such as an auto insurance company determining rates according to how a customer drives.
- **Paid virtual experiences:** Already being tested by Disney and art museums, this is the replacement of physical visits to amusement parks, sports venues, and museums.
- **Automatic remediation:** This automation of support enables operations to focus more on continuous engineering.
- **AIOps:** This concept, similar to DevOps, prevents unplanned downtime with automated change risk analysis continuous integration/continuous deployment pipelines.
- **Devised artificial intelligence (AI) orchestration platforms:** These platforms operationalize AI and deploy it similarly to container orchestration.
- **Hyperautomation:** Extending legacy business process automation beyond individual processes by marrying AI tools with RPA enables the delivery of automation for virtually any repetitive task executed by business users.¹²



How to get the maximum use from automation

The promise of automation cannot be realized in an on-premises data center that is housing an aging mainframe, legacy applications, and a rigid database with high licensing costs. In Gartner's predictions about automation, the cloud is ever present. The fastest and most effective automation technology is deployed in the cloud. The reason why is a no-brainer. Automation calls for a flexible, scalable, and high-performing cloud infrastructure—and modern, more agile applications and database management.

The good news is that you do not have to abandon or rewrite your legacy applications to enable automation. Nor do you have to develop APIs that connect to them from the cloud. Instead, you move your applications, along with your database or RDBMS if you wish, to a cloud-based environment with no reformatting, code changes or user impact. Once in this environment, they run as-is, but you also have the option of rearchitecting them to fit your automation plans. APIs available from different sources inside or outside IT can easily access that data and connect it to new automation applications.

¹² Brian McHugh, "Gartner's IT Automation Predictions for 2021," 2020. IT Automation Without Boundaries, 22 Dec.

Trend 7: Microservices and service mesh

Microservices have been around since 2009 at least. Recently, as more tech giants have publicized their moves to microservices, they have really taken off. This is because they resolve a lot of the problems of monolithic application architectures, which develop performance issues when they are scaled and are hard to change quickly. As companies have discovered that scalability can also be an issue with microservices, the service mesh is coming into play to help prevent downtime as an app grows.



What are microservices? What is a service mesh?

[Microservices.io](https://microservices.io) has this definition: “an architectural style that structures an application as a collection of services.”¹³ Software functionality is isolated into multiple independent modules that are individually responsible for specific standalone tasks. The modules communicate with one another via simple, universally accessible application programming interfaces (APIs). As a result, one team’s changes won’t break an entire app, unlike in monolithic application architectures. Microservices can be deployed in virtual machines or [containers](#); however, containers are becoming the microservices deployment method of choice.¹⁴

In the microservices world, an application can consist of hundreds of services. Each service could have thousands of instances. If the container deployment method is being used, a container orchestrator like [Kubernetes](#) is constantly changing the instances.¹⁵ This creates incredibly complex service-to-service communication, which is essential to microservices during runtime.

To ensure end-to-end performance, reliability, and security, organizations are increasingly turning to a service mesh, which adds observability, security, and reliability features to applications by inserting them at the platform layer rather than the application layer. As a result, the application doesn’t need to implement these features, or even be aware of the service mesh. For example, one type of service mesh architecture enables services to communicate with one another through a proxy that is outside the proxy.



Microservices, service mesh, and modern cloud infrastructures

Microservices, service mesh, containers, and Kubernetes all enable you to offer differentiated digital services to your customers or consumers. [Gartner predicts](#) that these technical advancements will be in place in 70% of organizations by 2022. They are a key aspect of digital transformation, and they can also help you make other tech trends, such as customer experience and automation, a reality.

What should not go unnoticed is these modern application structures were not built for the infrastructures of yesteryear. Although microservices and containers can run on virtual machines, they are more efficient, scalable, and powerful in the cloud. Plus, Kubernetes and service meshes need the cloud. Therefore, an on-premises data center that houses an aging mainframe, legacy applications, and a rigid database with high licensing costs is going to severely inhibit their use.

Instead, you should migrate your mainframe and legacy applications to a cloud infrastructure designed for microservices, service mesh, and more. Once in this environment, you can modernize your apps by breaking them into faster, responsive, agile microservices, and set up your service mesh. To enable your service mesh to help your microservice applications share data with one another, you should also consider a modern RDBMS that runs in the cloud.

¹³ “What are microservices?” microservices.io

¹⁴ “What is a container?” [Docker.com](https://docker.com)

¹⁵ “What is Kubernetes?” [Kubernetes.io](https://kubernetes.io)

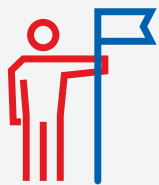
A fast path to modernization on the cloud

The common denominators for 2021's top 7 trends are modernization and the cloud. For many organizations, a cloud migration and application modernization are daunting prospects. The road to cloud and modernization nirvana is littered with companies who have not gotten optimal results. The key to success lies in a careful move to the cloud that starts by preserving what you have in your on-premises or hybrid environments and then rearchitecting it all later. This can be accomplished with a legacy modernization platform, a modern RDBMS, and an experienced partner.



What is a legacy modernization platform?

A legacy modernization platform is your fast path to the cloud, leaving the other options in the dust. You use specially designed software to move legacy mainframe applications to the cloud of your choice quickly and cost-effectively. Supporting COBOL, Assembler, PL/I, Easytrieve, and more legacy technologies, it deploys on AWS, Azure, and Google Cloud environments.



100%
Project success rate



> 100K
MIPS capacity

Multiple modernization strategies, on-prem or cloud, containerization and API flexibility



0

Change in business logic JCL or end-user experience



6-12
months

Average time of deployment



50-75%

Reduction in costs



Improved performance and security



Infinite

Flexibility to meet digital transformation goals

To deliver extremely high performance, a legacy modernization platform enables horizontal and vertical scalability and allows for significant reduction in annual run costs for increased investment in innovation. It also has options so you can take it slow or not worry about the migration at all:

- **Re-platforming:** Re-platforming recompiles and migrates mission-critical legacy business applications to the cloud and modernizes the data tier.
- **Refactoring:** Some outdated or unsupported legacy technologies are better handled by restructuring or converting them into another supported form.
- **Rearchitecting:** A legacy modernization platform supports the automated transformation of legacy applications into a modern microservices architecture on a cloud-native technology stack.
- **Legacy modernization platform as a service:** Hosted on the cloud, fully managed services migrate mainframe workloads to significantly reduce operating and capital expenses.



What is a modern RDBMS?

A modern RDBMS provides an enhanced view of processing, managing, and securing large-scale databases. It has the hyper-thread architecture, high-security database encryption, and multi-node parallel recovery required for a reliable, high-performance database. It scales with the cloud rather than proprietary database servers. It is highly compatible with Oracle, offers high availability with active-active clustering, high-performance transaction processing, and active or passive standby database capability.

A modern RDBMS reduces capital expenditures and operating expenses and simplifies licensing, while providing freedom of choice. Organizations only license the compute power associated to a given VM regardless of the amount of resources the database consumes.



Better together

The combination of a legacy modernization platform and a modern RDBMS provides customers and users with the modern cloud infrastructure needed for CX, data integration, digital cultures, digital innovation, composability, automation, and microservices and service mesh. This combination is a sensible option that enables organizations to take advantage of cloud's benefits quickly and painlessly. No workload or application is left behind, and any future applications built in the new infrastructure can use legacy data that is easily accessed.

Two TmaxSoft products, OpenFrame and Tiberio, can provide the legacy modernization platform and RDBMS to help you adopt any, some, or all of the 7 technology trends. When enterprises invest in both solutions, the result is a super-charged application and data infrastructure that runs flawlessly on the cloud.

To learn more about how TmaxSoft can help you modernize your legacy systems, please contact us to schedule a discussion and demo.

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