

Application Development and Platforms Primer for 2019

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The tectonic shift from project-centric to product-centric delivery in IT means that development organizations must fundamentally change. Application leaders must splice new digital DNA into their teams, transforming their development and platform strategies to excel in the era of digital products.

Scope

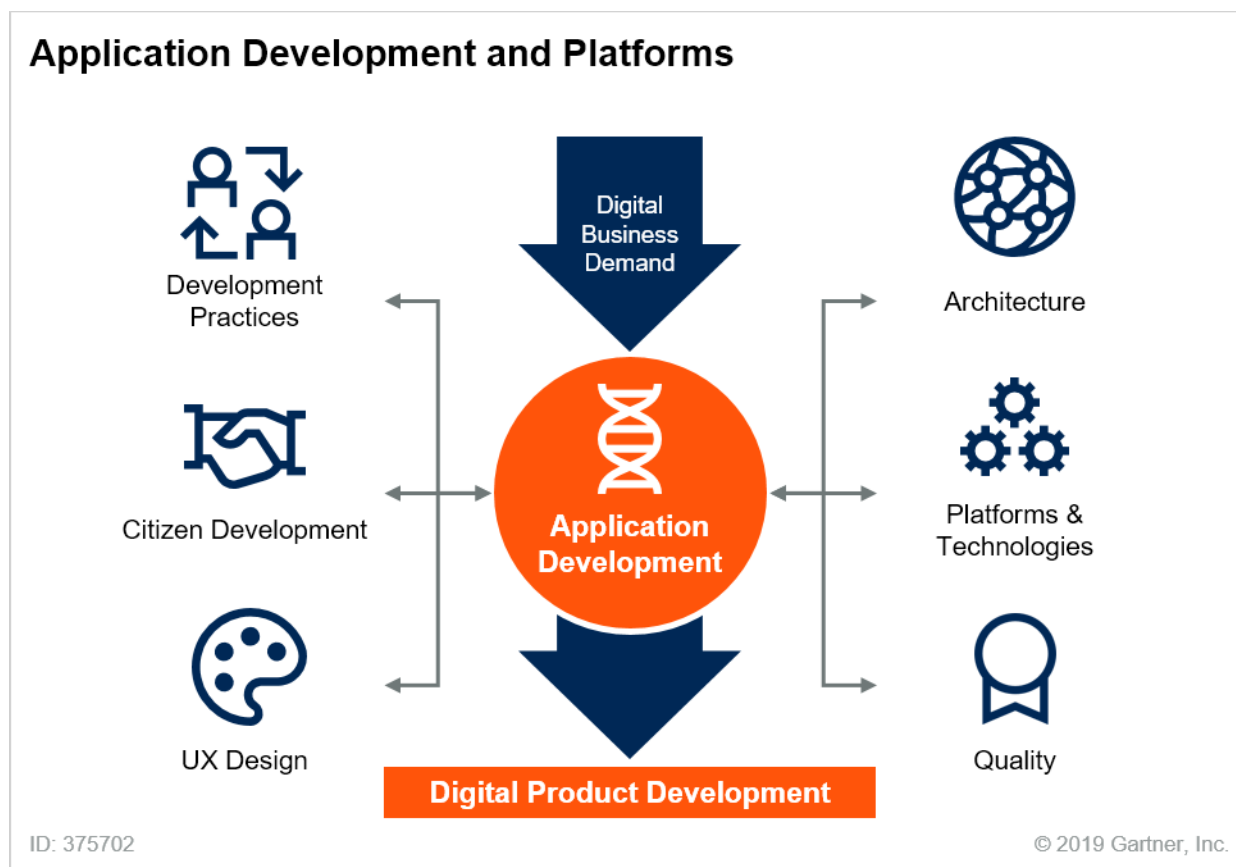
Use application development and platform strategies to build and improve internal competencies to create and scale differentiated and innovative digital products that support digital business demand.

This initiative covers:

- Development team practices
- Citizen development
- User experience design
- Application architecture
- Application platforms and development technologies
- Quality practices

Analysis

Figure 1. Application Development and Platforms Overview



UX = user experience

Source: Gartner (February 2019)

Continuous digital business demand means that application development and delivery organizations that stand still become outmoded. Even those that evolve slowly risk falling behind and being outsourced. You must continuously infuse new digital DNA — novel skills, practices and technologies — that improve and even replace existing development activities to rapidly affect positive change.

According to the 2019 Gartner CIO Survey, top-performing organizations have changed their DNA. They are more likely to invest in DevOps, define new architectures and tools, and hire or develop new talent.

To compete with top performers, application leaders must transform their development and platform strategies by expanding internal development competencies to power systems of differentiation and innovation. You need to scale agile, DevOps and citizen development practices, elevate the criticality of digital design and continuous quality, and introduce new software architecture

principles and disruptive technologies to transform development and platform strategies in the era of digital products.

Top Challenges and How Gartner Can Help

You must maximize your internal application development competency to create original software or differentiated capabilities on packaged and SaaS application. With the proliferation of multiexperience touchpoints for customers, partners and employees, application leaders must continuously introduce new digital DNA catalysts into the organization to either close the competitive gap, or widen your competitive advantage. You must rapidly change the fundamental makeup of development teams including practices, methodologies, technologies and mindset changes.

Application leaders must also think strategically about how development teams and business stakeholders can work together to best achieve long-term change that results in new business capabilities and business models. The introduction of new digital DNA will be different for each organization, depending on the existing makeup and maturity of your baseline activities. Gartner's 2019 research will guide you through the challenges of identifying and adopting the right strategies to accelerate and scale your digital business ambitions.

The topics we cover include these areas:

- Development team practices
- Citizen development
- User experience design
- Application architecture
- Application platforms and development technologies
- Quality practices

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Our research addresses the following common client questions.

How can we be more responsive to the business through modernization of development team practices?

The rhythms of digital business force development organizations to reduce the cycle times of their software delivery value streams. This enables them to quickly respond to customer demands and opportunities. It also provides the short feedback loops needed to learn which solutions deliver the most value.

The 2018 Gartner Agile Survey showed that that accelerated product delivery continues to be the main driver for agile adoption. Companies that lack the strategies and resources to meet this

demand risk having business leaders outsource their most vital initiatives, or try to go at it alone with “shadow IT” development efforts.

Organizations whose development practices include only traditional waterfall methods will be left behind. Agile, DevOps and modern development practices that enable continuous delivery must be part of your strategy to scale and accelerate development.

You must infuse:

New ways of making the most of your developer talent, including new techniques for motivation, skills acquisition, and skills augmentation through artificial intelligence and machine learning.

New architecture, methodologies, languages and tools that teams need to respond to demands for ever-faster delivery, higher performance and greater value.

New team structures and leadership skills that focus on self-organization, cross-functionality and end-to-end ownership of application delivery.

Planned Research

- Strategic roadmap for digital product development
- How to upskill your agile/DevOps teams
- Prepare for AI-driven software development
- Best practices for achieving agility despite monolithic architectures

How can we foster innovation and drive business agility by empowering citizen development?

The tempo at which digital business moves means that apps need to be delivered and updated faster than application development organizations alone can respond. You must enlist, empower and guide those outside IT — such as business analysts, marketers and HR professionals — to contribute to app innovation by converting shadow IT into citizen development initiatives.

You must implement a flexible development environment and a set of low-code development tools that enable citizen developers to participate in app creation and delivery. You must also work with business stakeholders and citizen developers to define the guardrails within which they must remain to control security, safety, compliance, and other enterprise risks.

Organizations with a citizen development capability can augment and supplement the professional development capacity they have to meet business demands. You must use citizen developers as a force multiplier, providing development and innovation at the edges of the enterprise by the employees themselves.

You must weave in:

- New automated governance and enablement techniques for scaling citizen developer activity and controlling risk.
- New low-code development tools and platforms that enable self-service for citizen developers to become productive quickly.
- New modes of cooperation and integration between citizen developers and IT developers to continuously delivery value through collaboration on digital products.

Planned Research

- How to accelerate and then scale citizen development
- End shadow IT by defining citizen development within the business
- Low-code application development vendor evaluation guide

How do we apply digital design to elevate the business value of app portfolios through better app and UX design?

User expectations on the intuitiveness and contextual relevance of apps are greater than ever, thanks to the “digital natives” that push the boundaries of user experience (UX). Likewise, the consumerization of IT means that employees now have higher expectations of internal apps; they must not only be useful, but also enjoyable to use. According to Gartner’s State of UX Design Survey, the typical ratio of UX designers to developers is a paltry 1:21 based on the respondents. Such insufficient investment in upfront digital design efforts can quickly undermine the expected business benefits, particularly in mobile apps and emerging conversational and immersive UIs.

Adopting an agile development process alone does not automatically make the delivered product’s UX any better. Organizations also must add new UX design methodologies, which will improve the success of agile product development by collaborating with the business in identifying the right product to build in the first place.

You must inject:

- New skills in design thinking, service design, user-centered design, and lean and agile UX.
- New definitions of software quality that include UX, and new processes and tools to ensure that quality.
- New UX-centric roles in your organization, such as UX architect and voice interaction designer.

Planned Research

- Combining design thinking and minimum viable product to ensure a great user experience
- Use product analytics to optimize for high-impact app UX
- Building a business case for better UX design

How can we modernize our application architecture to drive better business outcomes?

New app experiences with touchpoint-specific interaction modalities (touch, gestures or voice, for example) are proliferating as part of multiexperience development. User attention is shifting away from individual apps and splintering across touchpoints, such as progressive web apps (PWA), chatbots, voice apps, augmented reality (AR) and virtual reality (VR) experiences, and wearables. Front-end and back-end application architecture must be modernized and optimized to address the user journey across the digital spectrum.

You must implement key modern architecture principles — such as the mesh app and service architecture (MASA), API mediation, and event-driven architecture — to move multiexperience development capabilities forward. You need to determine when and where architectural innovation is appropriate, and when it is justifiable to rearchitect or replace existing systems to optimize the targeted business outcomes. Modernizing application architectures will result in changes to various development organization roles and responsibilities that will trigger cultural and organizational disruptions.

You must apply:

- New lightweight, composable technologies (such as microservices and serverless platforms) and new patterns (such as microapps) to support multiexperience development.
- New processes and policies to enable coexistence and interoperability among multiple services from diverse providers and ecosystems.
- New cultural, skills and organizational structure changes required for cloud-native application infrastructure.

Planned Research

- Getting started with microservices architecture
- Architecting applications with intelligent automation to improve business outcomes
- Key insights to kick-start multiexperience development
- Top trends in application architecture that enable your digital business transformation

How should we capitalize on the platform technologies, trends and tools disrupting software development to gain business advantages?

Organizations must get ahead of fast-moving technology trends and use digital disruptors to their advantage. New cloud platforms, development technologies, and AI services must be harnessed to bolster agile development and DevOps. Digital business also demands enhanced process modeling and business performance monitoring in the form of “DigitalOps” (see Note 2). To ensure success, you must carefully weigh the reward and risk of all these new platforms and technologies, and balance them with business outcomes in mind.

You must embrace:

- New programming skills and development tools for immersive and conversational interactions powered by cloud platforms and AI-services.
- New ML-driven process and decision models and algorithms that take continuous optimization and delivery to the next level.
- New development platforms focused on leveraging and delivering APIs, microservices and microapps that provide continuity across and beyond apps.

Planned Research

- Building a DigitalOps technology roadmap to achieve your digital ambitions
- Innovation framework for application development leaders
- Choosing the most important programming languages for digital business
- Applying the hybrid application platform framework for platform governance

How can we shift to a continuous quality mindset in order to shorten cycles and improve delivery outcomes?

Organizations face the challenge of saving money on testing while trying to increase release frequency, but without compromising on software quality. Development organizations can realize business advantages through agile practices that facilitate agile development that lead to fewer bugs, and greater software quality, according to Gartner's Agile in the Enterprise Survey.

Successful development organizations have abandoned conventional ideas of testing centers of excellence, and have shifted to integrating a continuous quality approach across roles and the application life cycle. They have also shifted focus from managing "projects" to managing "products" and are striving for testing to be highly automated and integrated into the product development team.

The transition to continuous automated testing changes the testing skill sets that you need — an upheaval that can be a significant hurdle for any QA organization. This also impacts the relationship between organizations and their testing service providers. Moreover, according to Gartner's survey on enterprise DevOps, a focus on people-related aspects is key to success, with team culture and utilization of correct leadership style as the two most essential factors for scaling DevOps initiatives.

You must impart:

- New continuous quality strategies that foster a companywide cultural change to achieve the goal of making quality the responsibility of all.
- New tools and skills in automated, continuous testing that leverage machine learning and AI services.
- New training, hiring and partnering approaches to acquire the skills needed.

- New ways of managing the cultural and organizational shifts introduced by the changing roles and responsibilities in QA.

Planned Research

- Expedite integration by implementing an API test automation strategy
- Strategic roadmap for continuous quality
- The impacts of modern application development on enterprise testing processes
- Identifying the right open-source approach to software testing

Related Priorities

Table 1. Related Priorities

Priority	Focus
Artificial Intelligence	This initiative equips enterprises to create the strategy and tactics necessary to deploy artificial intelligence, to ensure they remain competitive.
Integration Architecture and Platforms	This integration initiative deals with the architectures, practices and technologies needed to build a pervasive integration capacity that serves as the foundation for digital business.
Infrastructure, Operations and Cloud Management	This initiative focuses on the infrastructure and operational processes, technologies and human capabilities that enable desired business outcomes.
Digital Workplace Program	A digital workplace program is a business strategy to boost workforce digital dexterity through an engaging and intuitive work environment.
Application and Product Portfolio Governance	Gartner's research for application and product portfolio governance focuses on key capabilities and concepts that organizations must embrace as they evolve toward digital business.

Source: Gartner

Suggested First Steps

These are the most important pieces of research to understand this Key Initiative and the activities you should undertake first:

- “Avoid the Three Most Common Mistakes When Transitioning to Agile Development, or Struggle” — Successful agile transformation requires changing culture, building trust and guiding agile teams to expertise, good team chemistry and confidence.
- “New Insights Into Success With Agile in Digital Transformation” — Surprising results from a Gartner 2015 to 2018 survey trend analysis reveal that success in agile arises from key technical practices, organizational commitment to scaling, and persistence.

- “Move Away From Waterfall to Agile and Product-Centric Delivery Methods” — Digital business strategies require faster time to market than traditional waterfall methods are capable of delivering, and most digital business work is done in a product-centric manner.
- “Defining a Good User Experience With the Gartner User Experience Model” — The Gartner user experience model is a tool to define good user experiences from both within the organization and with users.
- “It’s Time for App Leadership to Reframe Mobile App Development Decisions” — Application leaders need to reframe mobile app development as a cornerstone that can lead to optimized user experience on multiple channels and touchpoints.
- “API Mediation Is the Key to Your Multiexperience Strategy” — For organizations with requirements that cut across multiexperience enablement, API delivery and integration, multiple tools may be needed for API mediation, including API management, iPaaS and ESBs, which brings further complexity.
- “Establish Guidelines for Selecting Cloud Platform Services” — This research shows application leaders how to use the hybrid application platform capability framework to help establish guidelines for selecting cloud platform services.
- “How a Service Mesh Fits Into Your API Mediation Strategy” — Application leaders must adjust their API mediation strategy to include a service mesh if they are deploying miniservices and microservices in containers or PaaS.
- “DevOps and Cloud Speed Are Driving the End of QA as We Know It” — Digital business requires application leaders to reconfigure their organizations based on lean/agile and DevOps practices, which emphasize collaboration and self-organization rather than functional silos.

Essential Reading

- “Digital Transformation Demands New Digital DNA for Application Development” — Application leaders must splice new “digital DNA” into their culture, processes and technologies to transform into top performing organizations.
- “Technology Insight for Multiexperience Development Platforms” — Adopting an appropriate multiexperience development platform to create a plethora of digital user experiences is crucial step for application leaders.
- “Innovation Insight for Microapps” — Application leaders should incorporate microapps in tandem with mesh app and service architecture and emerging multiexperience development.
- “Innovation Tech Insight for Business Rules Management Systems” — Business rule management systems and decision management suites help application leaders accomplish digital transformation.
- “Innovation Insight for Service Mesh” — Service meshes are attracting significant interest among application leaders, as they are a critical element of cloud-native infrastructure in support of digital platforms.

- “Hype Cycle for Application Architecture, 2018” — Application leaders must adopt new architectural models to support digital business, productivity requirements and modern delivery processes.
- “Hype Cycle for Application Development and Delivery, 2018” — Application leaders modernizing application development must aggressively investigate maturing innovations and proactively assess the emerging wave.
- “Hype Cycle for Mobile Apps and Multiexperience Development, 2018” — This Hype Cycle serves as a guide for application leaders as they monitor and adopt new app development technologies and approaches to ensure their multiexperience strategy succeeds.
- “Market Guide for Conversational Platforms” — For success in their chatbot and virtual assistant projects, application leaders must understand the emergent market for conversational platforms — tools to build multiple chatbots and assistants for the enterprise.
- “Market Guide for Enterprise Agile Frameworks” — This Market Guide provides a current snapshot of enterprise agile frameworks, which address the needs of application leaders delivering digital business solutions, allowing them to scale agile development.
- “Magic Quadrant for Software Test Automation” — This report helps application leaders choose vendors for integrating and effectively utilizing test automation tools in their DevOps toolchain to enable continuous delivery.
- “Magic Quadrant for Intelligent Business Process Management Suites” — Intelligent business process management suites use actionable, real-time insights from operations intelligence to augment the orchestration and automation of adaptive business processes, helping application leaders deliver better business outcomes by improving and transforming business processes.
- “Magic Quadrant for Mobile App Development Platforms” — Application leaders must use mobile app and web development technologies and practices to extend support for multiexperience development across mobile, web, conversational and immersive touchpoints. This report will help them select the right vendor.
- “Magic Quadrant for Enterprise High-Productivity Application Platform as a Service” — High-productivity aPaaS (hpaPaaS) provides rapid application development (RAD) features for development, deployment and execution — in the cloud.

Evidence

State of UX Design in Enterprises

This research was conducted via an online survey from 27 April through 10 May 2018, among Gartner Research Circle Members — a Gartner-managed panel composed of IT or IT-business professionals. In total, 141 members participated.

Agile in the Enterprise

This research was conducted via an online survey from 20 June through 4 July 2018, among Gartner Research Circle Members — a Gartner-managed panel composed of IT or IT-business professionals. In total, 200 members participated (of which 88% use agile methodologies for at least some of their application development).

The 2019 Gartner CIO Survey

This research was conducted online from 17 April through 22 June 2018 among Gartner Executive Programs members and other CIOs. Qualified respondents are the most senior IT leader (CIO) for their overall organization or a part of their organization (for example, a business unit or region). The total sample was 3,102, with representation from all geographies and industry sectors (both public and private). The survey was developed collaboratively by a team of Gartner analysts, and was reviewed, tested and administered by Gartner's Research Data and Analytics team.

Enterprise DevOps Survey 2017

This research was conducted via an online survey from 15 September through 2 October 2017 among Gartner Research Circle Members — a Gartner-managed panel composed of IT or IT-business professionals. In total, 73 members who are using or piloting DevOps at their organization completed the survey. Qualified participants included business end users with either an IT or IT-business focus as a primary role. The survey was developed collaboratively by a team of Gartner analysts and was reviewed, tested and administered by Gartner's Research Data and Analytics team.

Note 1 Definition of “Citizen Developer”

A citizen developer is an employee who creates new business applications for consumption (normally by themselves, but potentially with others) using development and runtime environments sanctioned (or at least not actively forbidden) by corporate IT or the enterprise line of business organizations.

Note 2 Definition of “DigitalOps”

DigitalOps is the beginning of a business discipline for increasing organizational agility. It encompasses a holistic set of methods and enabling technologies to plan, model, coordinate, govern and monitor the processes and physical/digital resources associated with how the firm delivers value via a digital platform in real time.

DigitalOps represents the “process” center of your digital transformation, providing the coordination and orchestration of systems and other resources. It incorporates mechanisms for sensing (process mining and performance metrics) and responding (real-time decision making and operational decision models), while potentially supporting dynamic learning and optimization (artificial intelligence and machine learning).

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