

Gartner®

# Software Engineering Technology Roadmap

Where and when to invest for maximum value

# Build your technology adoption plan

Gartner has researched software engineering organizations to determine:



**Deployment strategies**



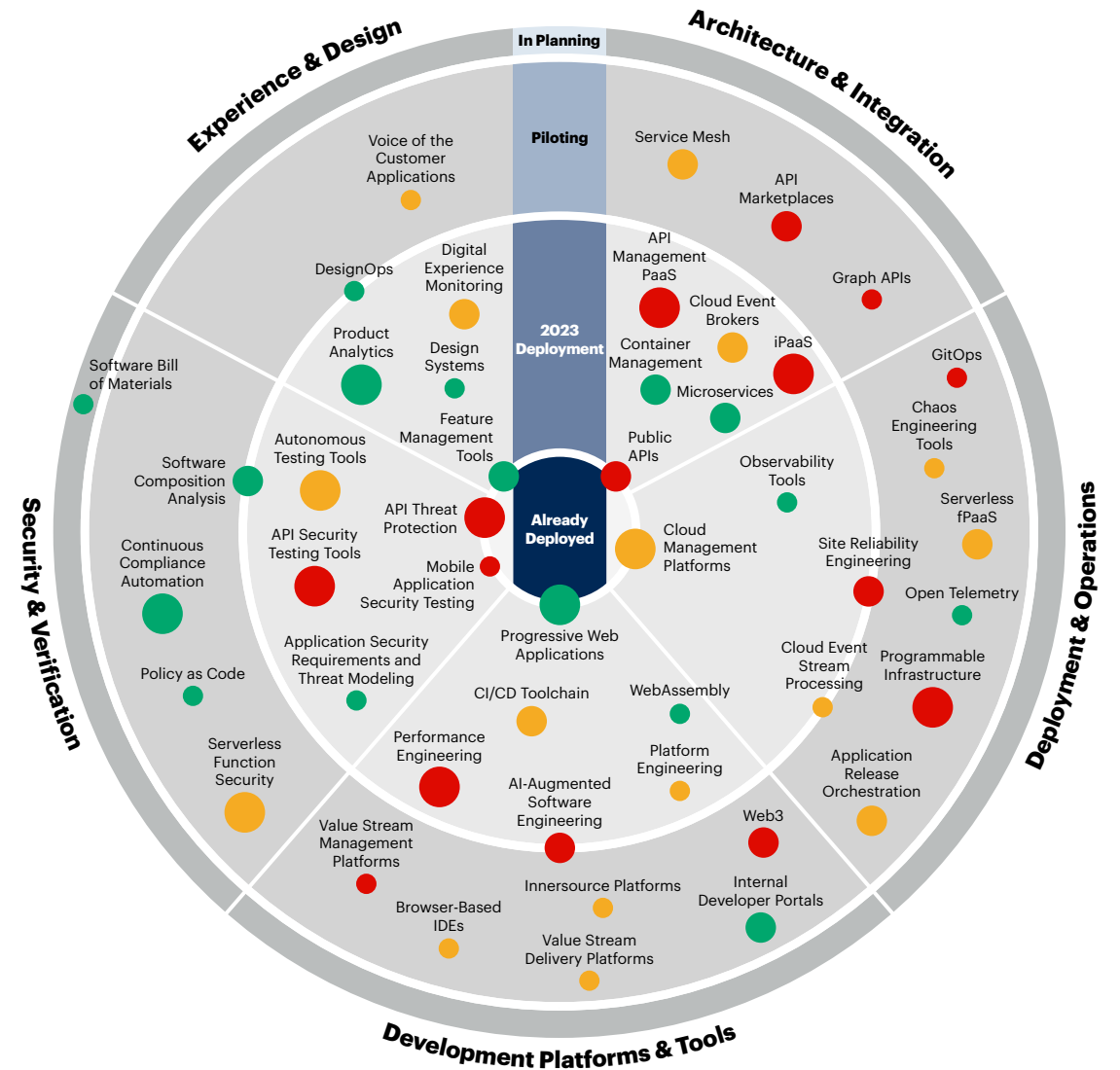
**Technology adoption timelines**



**Value and risks to the enterprise**

Based on this research, Gartner has produced a roadmap for software engineering technology adoption in these areas:

- Security and Verification
- Experience and Design
- Architecture and Integration
- Deployment and Operations
- Development Platforms and Tools





## Enterprise Value

Based on an analysis of drivers, including improved ability, enhanced developer experience, increased cost efficiency, enabled resilience and delivery of superior capabilities.



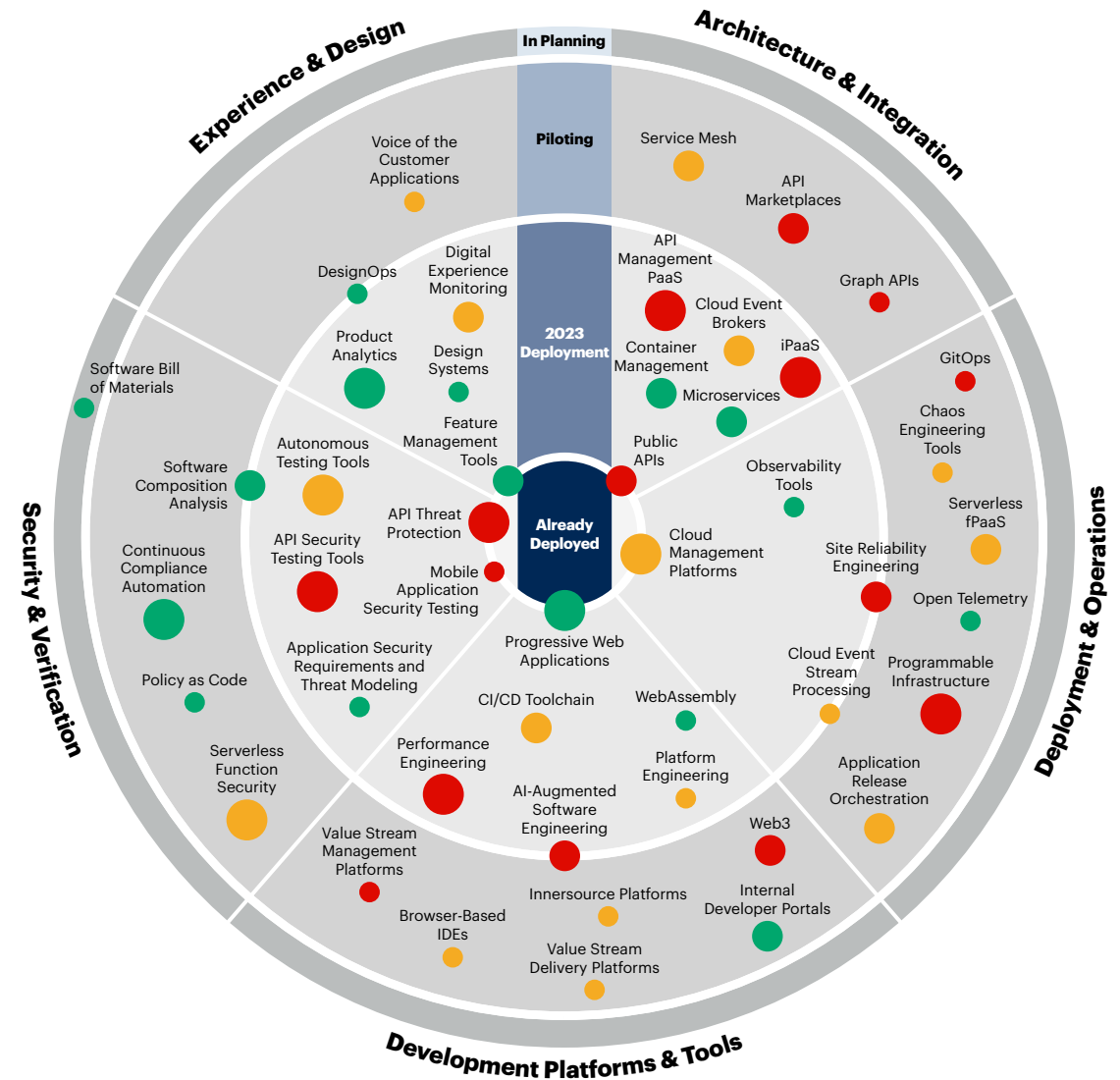
## Deployment Risk

Based on an analysis of potential risks, including cybersecurity risk, a lack of available talent, high or unpredictable costs, and technical incompatibility or architectural complexity.



## Adoption Phase

Determined by the current deployment plans for a majority of organizations. Technologies placed on the border are on the cusp of moving into the next deployment phase.





# High-value platform technologies and tools

The need to improve developer experience and productivity is driving the adoption of development platforms and tools.

## Enterprise Value

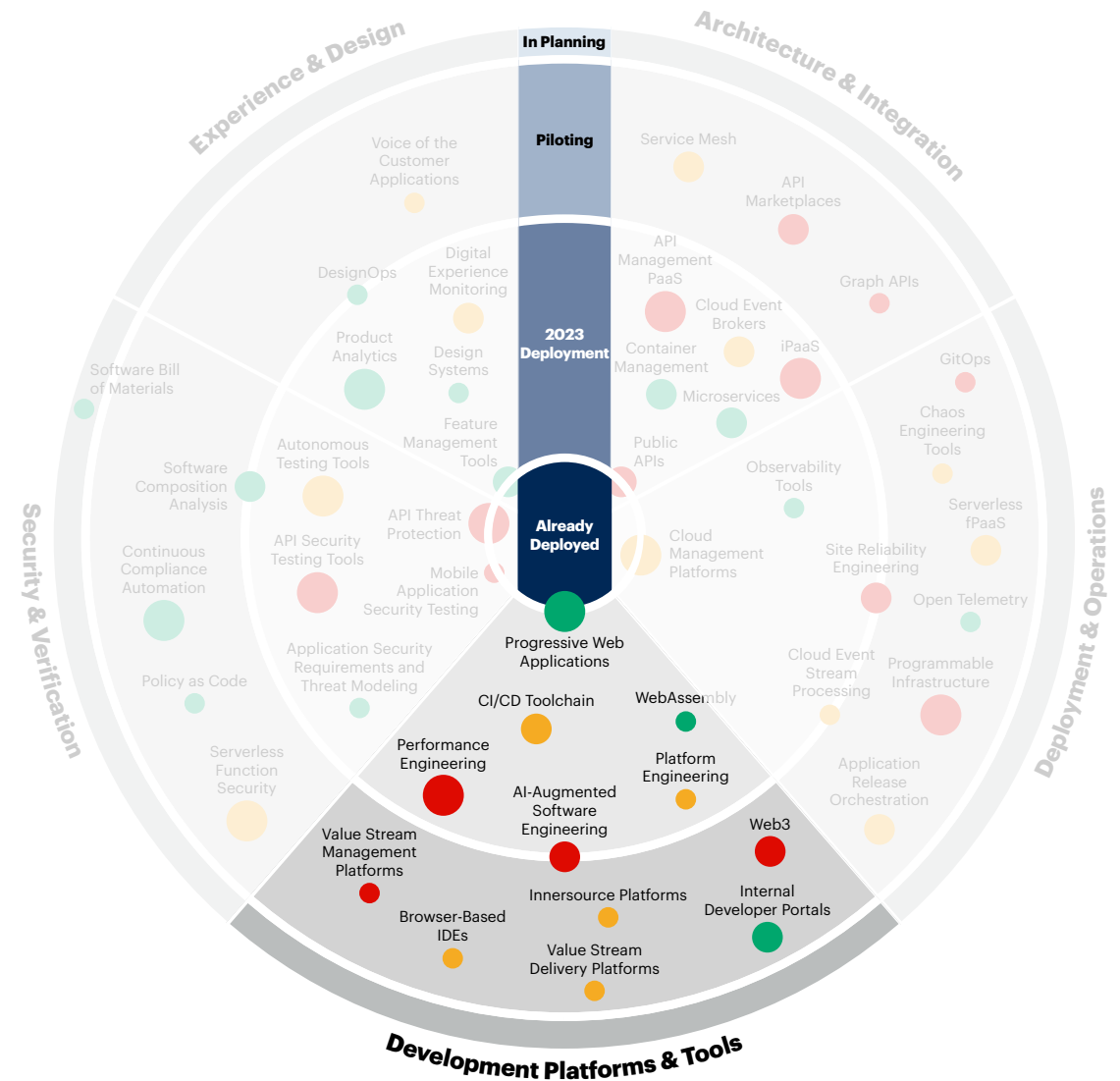
- High-quality developer experience has become a critical priority for software engineering leaders, with 58% reporting that it's very or extremely critical to the C-suite and their organizations.
- Enhanced developer experience or productivity is the top overall value factor for technologies and practices.

## Deployment Risk

High or unpredictable costs.

## Adoption Phase

Performance engineering and API management PaaS (cloud-delivered API management), along with platform engineering, design systems and container management are currently in deployment. Other technologies are piloting to enhance developer experience.



# User experience and design technologies

UX designers and software engineers increasingly rely on tools to analyze user experience patterns and develop easily navigable front-end interfaces for digital products and services.

## Enterprise Value

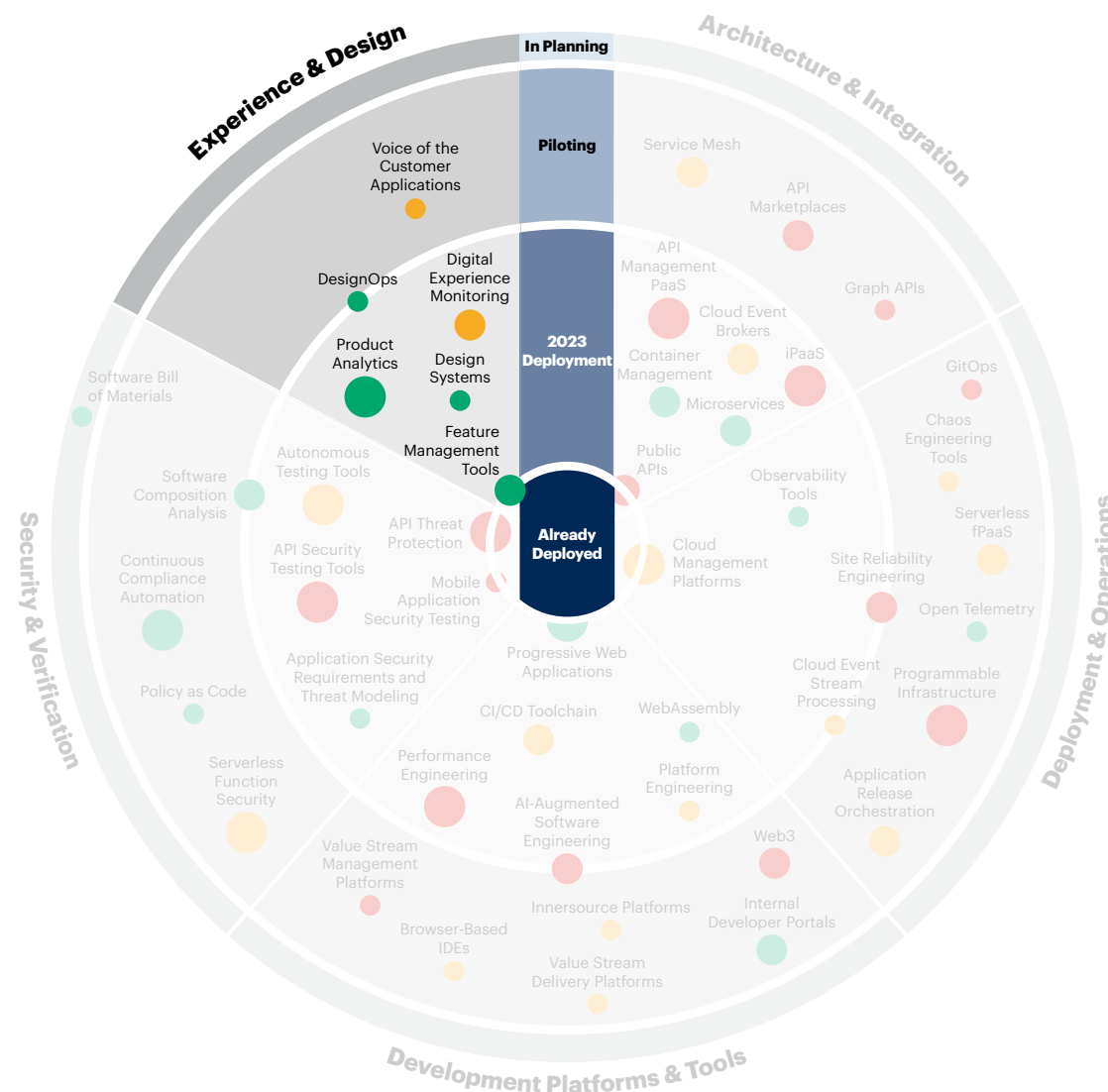
Software engineering organizations are adopting design systems, product analytics, feature management tools and digital experience monitoring.

## Deployment Risk

Delivering superior capabilities to the business or customer is the overall primary value driver for this category, with 67% of the technologies in this category considered low risk.

## Adoption Phase

Slated for 2023 deployment.







Platforms are foundational technologies that provide a stable and scalable environment for building and running applications, often requiring significant upfront investment.

Despite concern about high or unpredictable costs for these technologies, software engineering leaders see cloud management platforms and serverless fPaaS (function PaaS) as important.

A few have already been deployed, while others are being piloted in 2023.

The chart illustrates the maturity of various cloud-native technologies across five domains: Experience & Design, Architecture & Integration, Deployment & Operations, Development Platforms & Tools, and Security & Verification. The maturity is categorized into three stages: In Planning, Piloting, and Already Deployed.

**Technologies and their maturity status:**

- Experience & Design:**
  - Voice of the Customer Applications (In Planning)
  - DesignOps (Piloting)
  - Product Analytics (Piloting)
  - Autonomous Testing Tools (Piloting)
  - Software Composition Analysis (Piloting)
  - Continuous Compliance Automation (Piloting)
  - Policy as Code (Piloting)
  - Serverless Function Security (Piloting)
  - Value Stream Management Platforms (Piloting)
  - Browser-Based IDEs (Piloting)
  - Value Stream Delivery Platforms (Piloting)
- Architecture & Integration:**
  - Service Mesh (Piloting)
  - API Marketplaces (Already Deployed)
  - API Management PaaS (Already Deployed)
  - Cloud Event Brokers (Piloting)
  - iPaaS (Piloting)
  - Graph APIs (Piloting)
  - Container Management (Piloting)
  - Microservices (Piloting)
  - Public APIs (Piloting)
  - Observability Tools (Piloting)
  - Cloud Management Platforms (Piloting)
- Deployment & Operations:**
  - GitOps (Already Deployed)
  - Chaos Engineering Tools (Piloting)
  - Serverless fPaaS (Piloting)
  - Open Telemetry (Piloting)
  - Site Reliability Engineering (Already Deployed)
  - Cloud Event Stream Processing (Piloting)
  - Programmable Infrastructure (Already Deployed)
  - Application Release Orchestration (Piloting)
  - WebAssembly (Piloting)
  - Platform Engineering (Piloting)
  - Web3 (Piloting)
  - Internal Developer Portals (Piloting)
  - Innersource Platforms (Piloting)
  - AI-Augmented Software Engineering (Piloting)
  - CI/CD Toolchain (Piloting)
  - Performance Engineering (Piloting)
  - Application Security Requirements and Threat Modeling (Piloting)
  - Mobile Application Security Testing (Piloting)
  - API Threat Protection (Piloting)
  - API Security Testing Tools (Piloting)
- Development Platforms & Tools:**
  - Progressive Web Applications (Piloting)
  - WebAssembly (Piloting)
  - Platform Engineering (Piloting)
  - Web3 (Piloting)
  - Internal Developer Portals (Piloting)
  - Innersource Platforms (Piloting)
  - AI-Augmented Software Engineering (Piloting)
  - CI/CD Toolchain (Piloting)
  - Performance Engineering (Piloting)
  - Application Security Requirements and Threat Modeling (Piloting)
  - Mobile Application Security Testing (Piloting)
  - API Threat Protection (Piloting)
  - API Security Testing Tools (Piloting)
  - Autonomous Testing Tools (Piloting)
  - Software Composition Analysis (Piloting)
  - Continuous Compliance Automation (Piloting)
  - Policy as Code (Piloting)
  - Serverless Function Security (Piloting)
  - Value Stream Management Platforms (Piloting)
  - Browser-Based IDEs (Piloting)
  - Value Stream Delivery Platforms (Piloting)
- Security & Verification:**
  - Software Bill of Materials (In Planning)
  - Continuous Compliance Automation (Piloting)
  - Policy as Code (Piloting)
  - Serverless Function Security (Piloting)
  - Value Stream Management Platforms (Piloting)
  - Browser-Based IDEs (Piloting)
  - Value Stream Delivery Platforms (Piloting)



# Actionable, objective insight

Explore these additional complimentary resources and tools for software engineering leaders:

## eBook



### Building a World-Class Software Engineering Organization

Gain insights on the three key drivers of success over time for software engineering.

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## Webinar



### CIO & Software Engineering Leader Roadmap to Create a World-Class Organization

Walk through the simple roadmap to achieving a world-class software organization.

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## Infographic



### Platforms and Tools to Scale the Delivery of High-Quality Software

See the four critical software engineering needs to consider when implementing platforms and tools.

[View Now](#)

## Webinar



### The Gartner Strategic Trends for Application Platforms and Architecture

Explore methods and trends to meet the increasing demand for innovation, agility and scalability.

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