From Chris Howard, Chief of Research, Gartner

As we head into 2022, we continue to feel the human toll of the global pandemic, but we already know it has been a watershed period in which attitudes and norms have permanently shifted — in our everyday lives and at work.

Living through COVID-19 has increased social awareness — as have growing demands for equity for those who are underrepresented.

Businesses have also changed. For many organizations, the pandemic has catalyzed digital business initiatives as we adapt to the demands of employees, customers and other stakeholders, who were forced into new digital options that they have now come to favor.

B2B purchasers are happy to buy digitally, without a sales representative; B2C consumers are buying off social media platforms; employees are physically distributed and communicating asynchronously — and IT infrastructures must secure the organization despite this “anytime, anyway, anywhere” way in which we’re operating.

You and your team may be burning out, and it’s never been more important to prioritize your time and energy.

In your role as a leader, you’ve now spent months adapting to change and delivering new solutions at speed. You and your team may be burning out, and it’s never been more important to prioritize your time and energy. To help with that, Gartner Leadership Vision provides top-level guidance to leaders and their teams on where to focus — based on our data-driven research.

We’re providing detailed insights to our clients across dozens of roles, and we’re now excited to share excerpts with the business community beyond our clients. We hope this will help you to focus discussions with your teams, peers and other leaders, so you can more quickly and effectively diagnose priorities and actions, especially as you solidify your strategic plans for 2022.

Chris Howard
Chief of Research, Gartner
The imperative for software engineering leaders is to build software to deliver business capabilities and adapt software to changing business needs over time.

Software engineering extends beyond writing code and emphasizes technical excellence. It factors the platforms to run the software, including automation and low-code development, assembling teams, including cross-functional teams from across the organization, adopting the right architectures and designing high-quality experiences, and employing practices that guide you in building high-quality software efficiently.

The software engineering leader leads a team of software engineers and provides guidance in all of these areas. They support the business and help their team acquire and maintain the necessary skills, while fostering a culture for success.

Over time, a lack of technical excellence diminishes your ability to deliver business capabilities.
Application Leaders and Software Engineering Leaders Deliver Intelligent Composable Applications

The intersection of applications and software engineering

Source: Gartner
Three Challenges and Actions for Software Engineering Leaders

**Building and delivering quality software at scale**

47% of software engineering leaders say delivering secure software features among their performance objectives.

**Actions**

Focus on automation across the full delivery life cycle and maximize composable architecture.

**Delivering scalable and secure digital products**

Application programming interfaces (APIs) open access to data and application functionality to more users and ecosystem partners, but API security is a top concern.

**Actions**

Leverage APIs to provide the ecosystem with functionality, but install countermeasures against threats related to app integration.

**Building, developing and retaining high-performing teams**

High-performing teams deliver 53% better outcomes in employee experience and productivity and 37% better outcomes in attracting and retaining external customers.

**Actions**

Adopt cross-functional fusion teams and establish a talent development program.

Focus on Automation Across the Full Delivery Life Cycle and Emphasize Value Streams

Creating frictionless pipelines

<table>
<thead>
<tr>
<th>Value Streams</th>
<th>Version Control</th>
<th>Build Automation</th>
<th>Continuous Integration</th>
<th>Release Automation</th>
<th>Test Automation</th>
<th>Continuous Delivery</th>
<th>Continuous Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous flow of the highest quality and value</td>
<td>Single repository with trunk-based development</td>
<td>Single-touch build from source</td>
<td>Frequent mainline integration with automated test validation</td>
<td>Packaging and deployment of applications across all environments</td>
<td>Unit, integration and system tests without human interaction</td>
<td>Every change reliably and progressively releasable at any time</td>
<td>Products actively monitored in development and production</td>
</tr>
<tr>
<td>• Accelerated delivery</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Flow optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Waste minimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Concept to Cash

Source: Gartner

Automation for:
- Integration. Robotic process automation
- Application development. CI/CD pipelines
- Testing. Test automation
Emphasize Granularity to Maximize Composability and Optimize Architecture

Spectrum of options for microservices architecture

- Monolith
- Macroservices
- Miniservices
- Microservices

Greater data integrity, lower architectural complexity
Greater development agility, increased deployment flexibility, more precise scalability

Source: Gartner
Leverage APIs to Provide Ecosystem Access to Functionality ...

Source: Gartner
... But Install Countermeasures Against Threats Related to Application Integration

<table>
<thead>
<tr>
<th>Threats</th>
<th>Identity and Access Control</th>
<th>Data Security</th>
<th>API Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unauthorized access to SaaS or on-premises applications</td>
<td>Data privacy breaches, compliance failures</td>
<td>“Leaky APIs” exposing applications and data</td>
<td></td>
</tr>
</tbody>
</table>

| Countermeasures | Identity and access management, RBAC, API management | Data masking, data tokenization, cloud access security brokers | API gateways, web application firewalls, specialist API security products |

Source: Gartner
Note: RBAC: Role-Based Access Control
Adopt Cross-Functional Fusion Teams

**Functional teams versus cross-functional teams**

### Functional teams

- **User Experience**
- **Business Logic**
- **Database**

### Cross-functional teams

<table>
<thead>
<tr>
<th>“Orders” Service Team</th>
<th>“Customers” Service Team</th>
<th>“Inventory” Service Team</th>
<th>“Search” Service Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logic</td>
<td>Data</td>
<td>UX</td>
<td>Ops</td>
</tr>
<tr>
<td>Service</td>
<td>Service</td>
<td>Service</td>
<td>Service</td>
</tr>
</tbody>
</table>

Source: Gartner
Establish a Talent Development Program

**IT skills inventory process**

**Week 1**

- **Kickoff**
  - Validate the scope
  - Review objectives
  - Identify the project team
  - Define key roles of responsibilities

- **Information Gathering**
  - Develop questionnaire (survey questions)
  - Identify "cuts" of data needed
  - Gather skills and competencies information (what is needed now and in future)

- **Identification**
  - Select skill competencies to be inventoried
  - Identify job families
  - Map inventory participants to job families

**Duration**

- **Collection**
  - Provide access to survey
  - Have participants self-assess (using selected survey tool)
  - Roll out inventory by job family
  - Have managers validate proficiency levels (recommended)

- **Data Analysis**
  - Perform multiple data cuts
  - Analyze data
  - Summarize findings

- **Delivery**
  - Provide data to stakeholders
  - Present findings

**Week 8**

- **Communication**
  - Communicate project to the organization and the objectives
  - Distribute instructions for completing inventory
  - Communicate job family rollout timetable

- **Communicate progress and “next steps”**
- **Communicate results, where appropriate**

*Source: Gartner*
Action Plan for Software Engineering Leaders in 2022

- Build APIs
- Enable skills development
- Embrace fusion teams
- Automate across the life cycle
- Optimize architectural granularity
- Adopt a UX mindset

Source: Gartner
Leadership Vision for 2022: Top 3 Strategic Priorities for Software Engineering Leaders

Actionable, objective insight

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

**Tool**
Gartner IT Score
Benchmark key processes and activities to advance your function.

**Tool**
Gartner BuySmart™
Reduce costs, avoid pitfalls and buy technology with confidence.

**eBook**
3 Key Goals for Software Engineering Leaders to Sustain Digital Momentum
Learn key strategies to accelerate your digital transformation.

**Resource Hub**
How to Lead, Innovate and Optimize Your Software Engineering Teams to Drive Digital Business
Learn about the trending insights and tools for software engineering leaders.

Already a client?
Get access to even more resources in your client portal. Log In
Get actionable, objective insight to deliver on your most critical priorities. Our expert guidance and tools enable faster, smarter decisions and stronger performance. Contact us to become a client:

**U.S.:** 1 855 811 7593  
**International:** +44 (0) 3330 607 044

Learn more about Gartner for IT Leaders  
gartner.com/en/information-technology

Stay connected to the latest insights  
[Connect on LinkedIn](#)  
[Follow on Twitter](#)  
[Watch on YouTube](#)