



Streamlining application modernization with cloud tech currency analysis

By Muthuramalingam Anbarasu,
Associate Director, AWS Business Group,
AWS MAP Delivery





In an era of relentless economic flux, organizations across various sectors are grappling with mounting cost pressures. This has led to a strategic reevaluation of investments, and a focus on adapting to a new normal shaped by evolving market needs and consumer expectations. Consequently, most businesses today are trying to curtail the total cost of ownership (TCO) associated with operations and maintenance.

The digital landscape is rapidly changing and businesses are evolving their application frameworks to stay resilient and responsive. This involves embracing digital transformation to drive predictable outcomes and spur innovation. However, this journey is fraught with challenges, including the proliferation of complex applications and outdated legacy systems that resist integration with modern architectures, leading to inflexibility, security vulnerabilities and compliance hurdles.

This condensed guide outlines a systematic approach to technology upgrade analysis and application modernization, providing actionable insights for navigating the digital transformation landscape effectively. The most common triggers for technology upgrades are listed in Figure 1.

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- ✓ **End of support/end of life announced (EOS/EOL)**
for standard/tech/
domain software
 - ✓ **Security and compliance,
scalability and
supportability**
 - ✓ **Infra complexities—
hardware dependent**
(e.g., 32-bit vs. 64 bit)
 - ✓ **Bug fixes, performance
tuning, new features
(digital strategy)**
 - ✓ **Client priorities:**
cloud migration,
architecture change,
product replacement, etc.
 - ✓ **Total cost of ownership**
Operation and
maintenance cost
overhead

Figure 1



The tech currency analysis imperative

Modernizing applications is not just about keeping pace with technological advancements; it is also about unlocking future business value. By upgrading technologies and revamping legacy systems, organizations can scale operations and transition smoothly to cloud-based infrastructures. The key lies in maintaining technology currency by ensuring that software and hardware versions are up-to-date and supported by vendors, which minimizes technical debt and mitigates security risks.

Methodology and benefits

Our approach to application modernization hinges on a robust methodology that delivers substantial improvements in code quality (50%–70%) and optimization of modernization expenditures (10%–25%). By upgrading the technology currency, we aim to slash technical debts by 5%–10%.

Phased process for tech upgrade analysis

Many of the challenges within an application portfolio stem from technical and operational debts. These debts compromise both business agility and operational resilience, leading to an increased TCO. Consequently, technology upgrades are a critical prerequisite for any digital transformation initiative. Software versions that have reached their end of life (EOL) or end of support (EOS) are inefficient, often operating with obsolete security patches. Therefore, upgrading to the latest technology—referred to as tech currency upgrading—is essential for maintaining a risk-free application portfolio. Such upgrades can reduce technical debt by 10%–20%.

During the process of analyzing technology upgrades, we evaluate the tech currency (version of each application) and identify outdated versions (those that have reached their EOL or EOS) based on an analysis of each application within the tech stack. Subsequently, we provide recommendations—either to upgrade or modernize—specifically for applications deemed critical to the business or those with significant business potential, as shown in Figure 2.



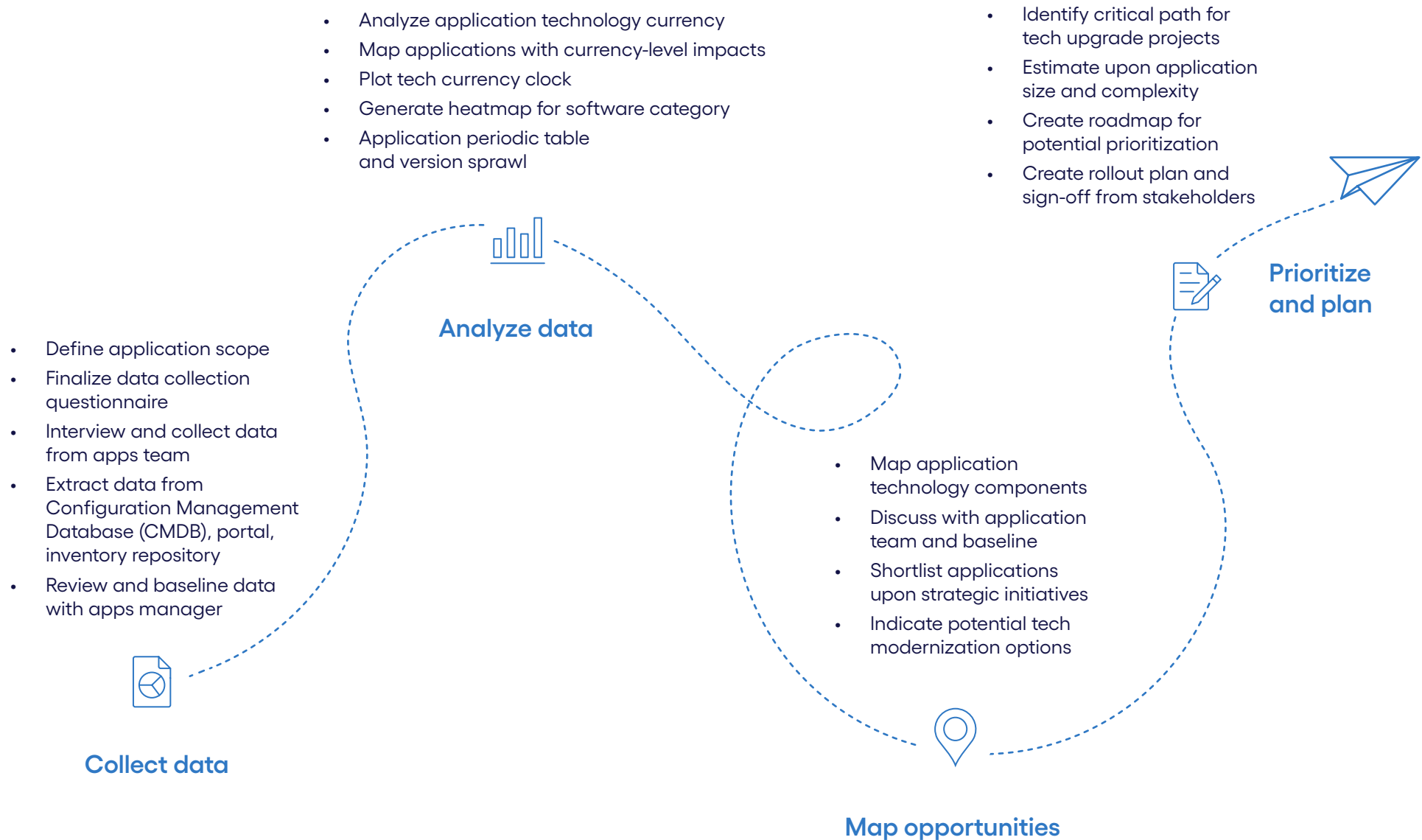


Figure 2

Data collection

Establish a baseline for the application scope and gather comprehensive tech stack data.

Data analysis

Conduct a detailed tech currency analysis to identify outdated versions and recommend upgrades or modernization for critical applications.

- Innovative techniques

- **Tech currency clock/radar:**

- A visual tool that segments technology lifecycles into four categories, prompting timely upgrades, as shown in Figure 3.

- **Technology heat map:**

- A strategic visualization that categorizes software lifecycles, highlighting areas that need immediate attention, as shown in Figure 4.

- **Technology periodic table:**

- A snapshot of technological sprawl, aiding in decision-making for upgrades and rearchitecting efforts, as shown in Figures 5 and 6.





Figure 4

Periodic table—before tech upgrade

		ASP .NET MVC 4						
		Hybernate 2						MS Sql server 2008
	AngularJS v1.5.0	Hybernate 3.3						MySQL 5.6
	AngularJS 1.7	ASP .NET MVC 4.0.3						Oracle 11g
	AngularJS 1.7.8	Spring MVC 4						Oracle DB 11.2.0.4
	Angular 9	Spring MVC 4.1.4						MS Sql server 2012
.NET 2	Angular 10	Spring 4						SQL Lite(3.9)
.NET 4	Bootstrap 3.0.0	Spring 3						RHEL Oracle DB 12g
.NET 4.2	Bootstrap v3.3.6	Spring Boot 1.3.3			Apache TomCat 7			Oracle 12
.NET 4.5	jQuery 1.4	Spring Boot-1.5.8	Log4J v1.x		Apache TomCat 8			Oracle 12.2
.NET 4.5.2	jQuery 1.7.1.1	Entity Framework 4	log4j(1.17.26)		IIS 7		Planisware 6.2	Oracle 12c
.NET 4.6.1	jQuery 1.7.2	Entity Framework 5	log4j(1.2.15)		Apache TomCat 8.5	Windows Server 2008 R2	Abbott Informatics Starlims 11	MS SQL server 2014
Delphi 10.1	jQuery 1.10.2	ASP .NET MVC 5	log4j(2.12.1)		Apache TomCat 9	Android 11	Elysia-Raytest GINA 10.4	MS SQL server 2016
C# .NET 4	jQuery 2.0.2	ASP .NET Razor 3.2	log4j(2.13.3)	Jasper report(5.6.0)	Apache TomCat 9.0.7	iOS 15	GDM ARM 2021	MS SQL server 2017
PHP 5.5	jQuery v2.1.1	Entity Framework 6.1	log4j(2.6/2.1/1.2)	Delphi XE7	Apache Server 2.4	Red Hat Linux 6	IDBS Activity Base 9.7	MySQL 5.7
PHP 5.5.38	jQuery 2.2.4	Entity Framework 6.2	log4net(1.2.10.0)	PowerBuilder (Appeon) 2017 R2	IIS 10	Redhat Linux 7.x	KNIME KNIME 4.14.1	MySQL 5.7.22
Java SWING	HTML 5	Maven 3.8	log4net(1.2.13)	PowerBuilder (Appeon) 2017 R3	IIS 10.0	Windows 10	Molecular Devices metaXpress 6.7	Oracle 18c
Swift 4.1.1	Groovy 2.4		log4net(1.2.15.0)	Tableau(2020.2.5)	IIS 2012	Windows Server 2012 and R2	Thermofisher Chromeleon 7.2 SR5	Oracle 19c
Java 1.8 / 8	AngularJS 13	Springboot(2.x)	log4net(2.0.5)	SharePoint 2013	IIS 2012 R2 Standard	Windows Server 2016	Waters SDMS 9	PostgresSQL 11.5
Java 11	Node.js 16.9	Unity.Mvc5.1.2.3	log4j(2.17)	SharePoint 2019	IIS 8.5.9600	Windows Server 2019	LIMS 11	SQL Anywhere 17
Primary tech/ programming language	Secondary tech/web/ scripting	Frameworks/ libraries	Logging frameworks/ utilities	Middleware/ peripheral tech/ platform	App and web servers	App and DB operating system	COTS product	Database

Periodic table—after tech upgrade

								Planisware 7.x	
								Abbott Informatics Starlims 11	
								Elysia-Raytest GINA 10.4	
								GDM ARM 2021	
								IDBS Activity Base 9.7	SQL Lite 3.38.2
.NET 4.8	Bootstrap 5.x	ASP .NET MVC 5.2.7	Hybernate 5.6.0					Android 12	KNIME KNIME 4.14.1
PHP 8.1	jQuery 3.6.0	SpringBoot 2.6.6					iOS 15	Molecular Devices MetaXpress 6.7	MS SQL server 2019
Swift 5.6	Groovy 4.0	Entity Framework 6.4.4			Jasper Report 8.0.x	Apache TomCat 10.x	Redhat Linux 7.x/8.x	ThermoFisher Chromeleon 7.2 SR5	MySQL 8
Java 8	AngularJS 13	Maven 3.8	log4j 2.x	Tableau 2022.1	Apache Server 2.4	Windows 11	Waters SDMS 9	PostgresSQL 14	Oracle 19c
Java 11	Nod.js 16.14	Unity.Mvc5.1.2.3	log4net 2.0.14	SharePoint 2019	IIS 10.0	Windows Server 2019	LIMS 11	SQL Anywhere 17	
Primary tech/ programming language	Secondary tech/web/ scripting	Frameworks/ libraries	Logging frameworks/ utilities	Middleware/ peripheral tech/ platform	App and web servers	App and DB operating system	COTS product	Database	

Figure 6



Mapping opportunities and prioritization

Identifying obsolete components and their impact on application health is crucial. By mapping technology components, we can pinpoint applications that require immediate attention for upgrades or replacements. This process helps prioritize applications based on their criticality, size and complexity to ensure focused actions for technology upgrades, as shown in Figure 7.

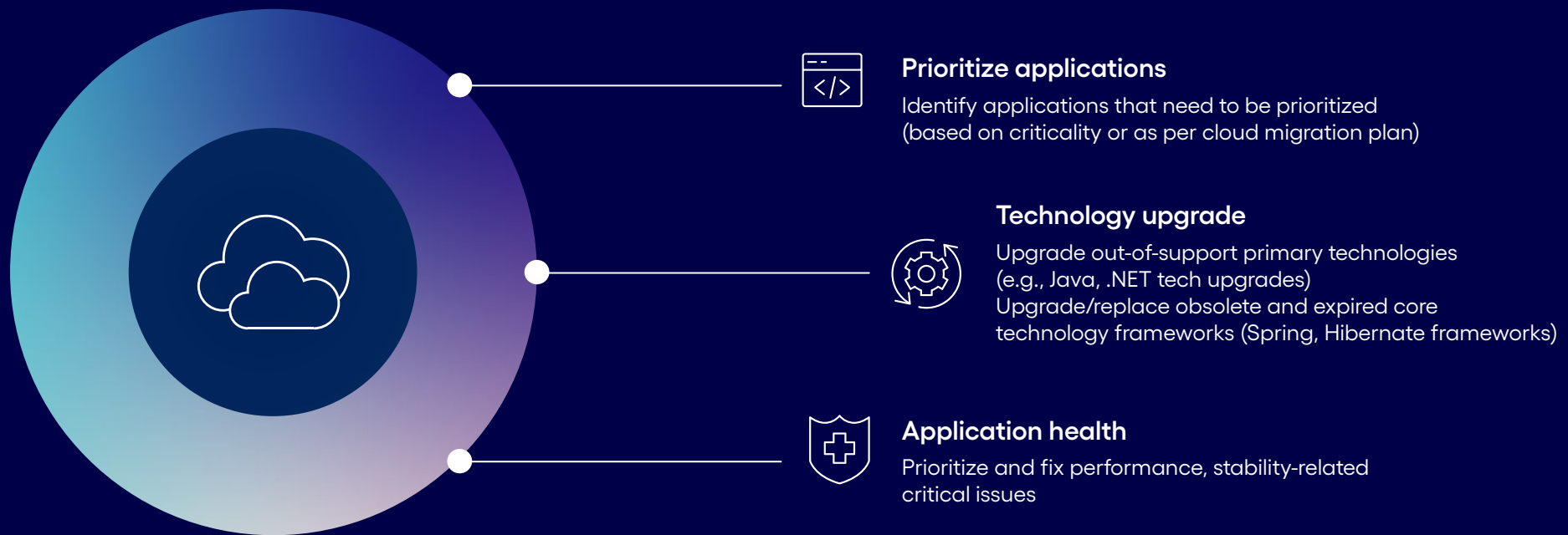


Figure 7

The business could also leverage other technology modernization options such as the examples listed:

- .NET apps—upgrade to .NET framework 4.8 and migrate to PaaS
- COTS apps—transform to SaaS or look for an alternate cloud hosting option
- Containerize/PaaSify applications with relevant app/web server
- Desktop apps—rearchitect through microservices with cloud-native features
- Oracle/SQL servers—migrate to managed database services on cloud such as PaaS DB services, etc.

Success story for one of our life science clients

A leading German multinational company in the pharmaceutical sector faced significant challenges due to a complex IT landscape that made it difficult for them to respond quickly to dynamic business changes. Their objective was to:

- Eliminate/minimize the business service impact due to an outdated technology stack
- Simplify the technology stack and identify opportunities for app modernization
- Optimize IT costs through automation, rationalization and cloud adoption
- Improve time-to-market based on delivery

Overall, applications in scope totaled 95 within R&D, load balancer, local apps and portfolios. The application landscape consisted primarily of self-made (custom-built) web applications with 65% of applications (> 60) as .NET, Java and three apps built on PHP technology.

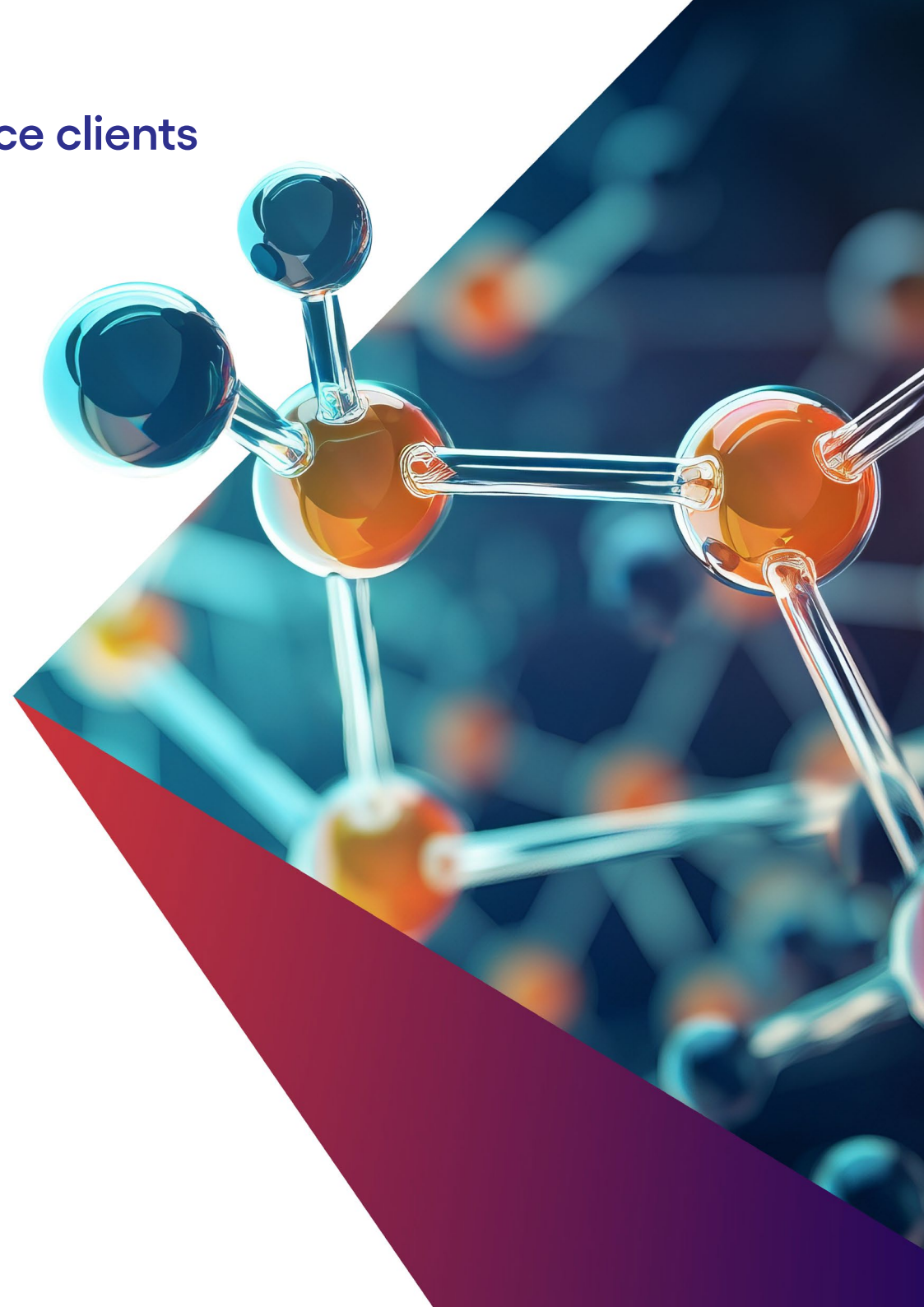
25% of applications
(24), running on
Citrix server

66% of applications
(63) are hosted on
Windows servers

54% of applications
(51) connect to
Oracle database

20% of application
(19) are leveraging
Log4j and Log4net
logging frameworks

IIS and Tomcat are
mostly used for web/
app servers



The tech currency analysis discovered many hindrances using different techniques:

- 67% of applications are impacted by “expired” technologies
- There are legacy tech stack apps—Power Builder, Delphi, Java SWING, Applet apps, etc.
- Too many versions of technology components are used, which impact code maintainability, make it difficult to upgrade tech and cause tight coupling/dependency with other tech, as shown in the following:

.Net 2, 4, 4.2, 4.5, 4.5.2, 4.6.1

jQuery 1.4, 1.7.1.1, 1.7.2, 1.10.2, 2.0.2, 2.1.1, 2.2.4

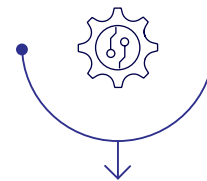
Log4J v1.x (2.1.1, 1.17.26, 1.2.15)

AngularJS 1.5, 1.7, 1.7.8, 9, 10

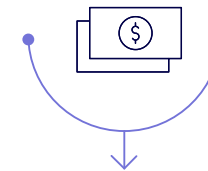
Cognizant’s tech currency analysis methodology offers organizations a significant advantage in identifying opportunities to replatform through tech upgrades that are in line with the strategic enterprise roadmap for cloud migration and modernization.

Our team’s intervention streamlined the company’s R&D portfolio and proposed to reduce the application tech stack components by 40%, thereby enhancing operational agility and reducing time-to-market.

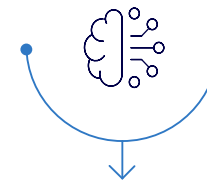
Benefits to the business



**10–25%
reduced
modernization
spend through
tech upgrades**



**5–10%
reduced
technical debts
through currency
upgrades**



**50–70%
improvement in
code quality**

Conclusion

As organizations pivot towards a future driven by advanced technologies, the need for a methodical approach to application modernization becomes paramount. By adopting the strategies outlined in this guide, businesses can ensure operational resilience, compliance and the ability to remain competitive in an ever-evolving digital arena.



About Cognizant

Cognizant (Nasdaq-100: CTSI) engineers modern businesses. We help our clients modernize technology, reimagine processes and transform experiences so they can stay ahead in our fast-changing world. Together, we're improving everyday life. See how at www.cognizant.com

World Headquarters

300 Frank W. Burr Blvd.
Suite 36, 6th Floor
Teaneck, NJ 07666 USA
Phone: +1 201 801 0233
Toll Free: +1 888 937 3277

European/UK Headquarters

280 Bishopsgate
London
EC2M 4RB
United Kingdom
Tel: +44 (0) 20 7297 7600

India Operations Headquarters

5/535, Okkiam Thoraipakkam,
Old Mahabalipuram Road,
Chennai 600 096
Tel: 1-800-208-6999
Fax: +91 (01) 44 4209 6060

APAC Headquarters

1 Fusionopolis Link,
Level 5 NEXUS@One-North,
North Tower,
Singapore 138542
Phone: +65 6812 4000

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