AARON HEBERT & ALYSSA PUGH

From Code to Contract: Securing Software Development

KEYS 2026 HORIZONS

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Aaron Hebert
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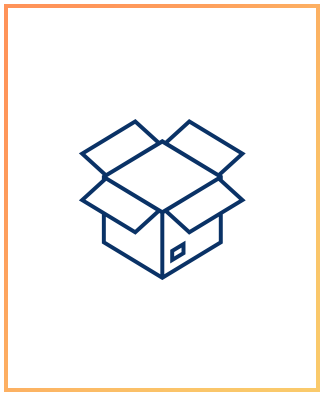
WHY SECURE SOFTWARE DEVELOPMENT?

More Expensive Incidents



Less Contained Software

More Focus from Regulators

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THE TIME RESERVATION
I don't have time to review all software for security.

THE EXPERTISE RESERVATION
I'm not a developer. How can I know if it's secure or not?

THE RISK RESERVATION
What's the actual risk involved if I don't think about security?

THE OSTRICH RESERVATION
… software? Never heard of it. 🤔

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Not all software is created equal.
Your security and risk management practices shouldn't be equal either.

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SESSION AGENDA

1. Five Factors for Secure Software Development
2. The System Development Life Cycle (SDLC)
3. Integrated Components
4. Third-Party Risk Management
5. The Impact of Artificial Intelligence

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Five Factors for Secure Software Development

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FIVE FACTORS

1. Platform Types
2. Software Types
3. Developer Types
4. Data Types
5. Operational Criticality

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PLATFORM TYPES

1. Web-based applications
2. Desktop applications
3. Mobile applications
4. Client/server applications
5. Cloud infrastructure
6. Analytics solutions
7. Databases
8. Models
9. Automation and scripting
10. Application programming interfaces

⚠ Anything that manipulates or instructs a computer to do something needs to be reviewed.

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SOFTWARE TYPES

COTS Software

- Productivity Tools
- Collaboration Platforms
- Creative Apps
- Web Browsers

SECURITY RESPONSIBILITY
The Vendor

Enterprise Software

- Core Systems
- CRM Platforms
- ERP Solutions
- GRC Software

SECURITY RESPONSIBILITY
Shared by Both

Custom Software

- Proprietary Systems
- Custom Analytics Tools
- Workflow Automation
- API Development

SECURITY RESPONSIBILITY
The Organization

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DEVELOPER TYPES

In-House Developers	Third-Party Developers
Professional Developers	Vendor / Independent Developers
Citizen Developers	Open-Source Developers
Autonomous Developers	Autonomous Developers

Where your software comes from determines your visibility and control. 🤖

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DATA TYPES

Classification	Context Example
Public / Unclassified	Business Data
Private / Sensitive	Personnel Data
Restricted / Confidential	Customer / Member Data

➡️ The more sensitive the data, the stronger the controls you must apply.

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OPERATIONAL CRITICALITY

- Critical (3 Hours)
- Urgent (24 Hours)
- Important (72 Hours)
- Normal (7 Days)
- Nonessential (30 Days)

Does this software support critical business functions?

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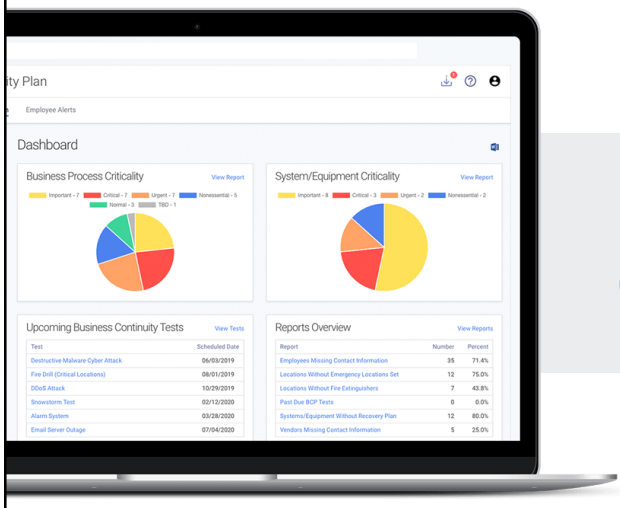

Tandem Business Continuity Plan Software

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The System Development Life Cycle

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GUIDANCE

FFIEC Development, Acquisition, and Maintenance Booklet

ithandbook.ffiec.gov

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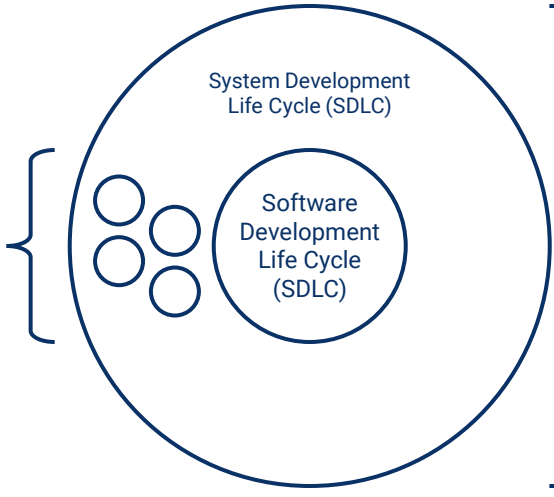
THE "SDLC"

- Hardware Development
- Big Data Development
- Model Development
- Database Development



Secure Development Life Cycle (SDLC)

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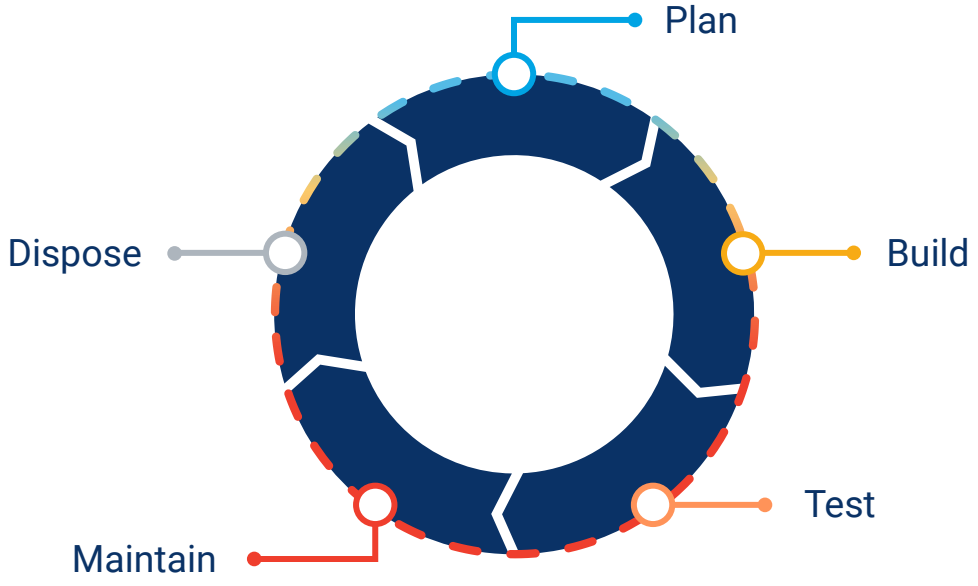
SYSTEM DEVELOPMENT LIFECYCLE (SDLC)



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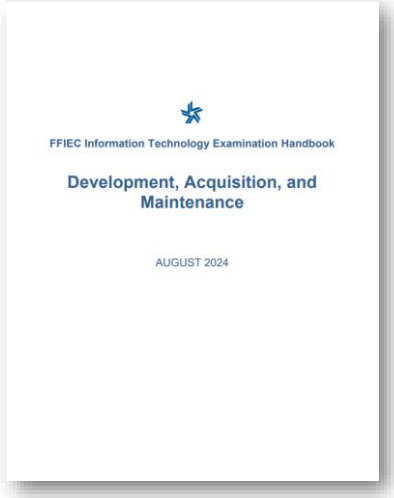
THE SDLC | PLAN

- Risk Assessments
- Policies and Procedures
- Quality Assurance Plans
- Technical Plans



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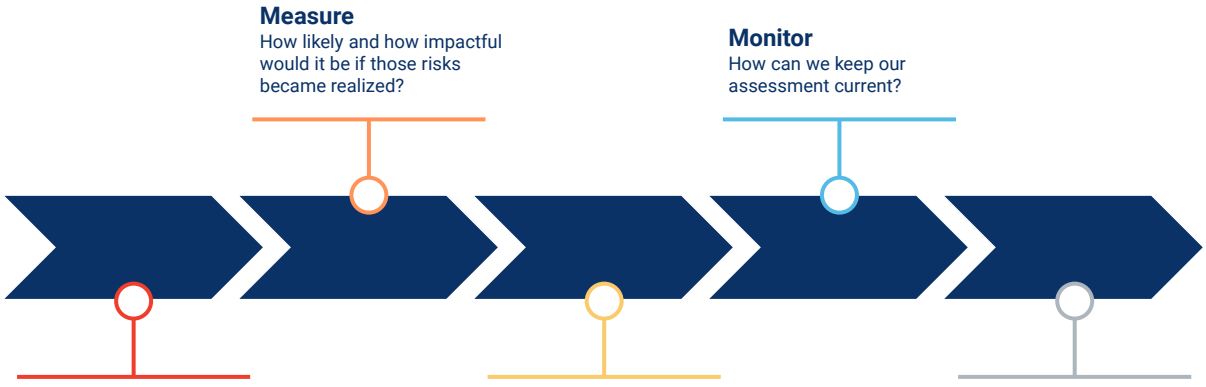
PROJECT RISK ASSESSMENT



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THE SDLC | BUILD

Industry-Standard Programming Languages

Processing Controls & Input Validation

Version Control System

Detailed Documentation

Source Code Repository Backups

"Management should establish development standards, including procedures for controlling changes during the development process that address the following: [system controls, quality management, release management, documentation, and reporting.] Development standards should articulate the entity's minimum development requirements. For example, development standards may address the selection of programming styles, languages, and tools; layout or format of scripted code; naming conventions; and program library requirements."

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THE SDLC | TEST

1 Code Assessments

2 Quality Assurance Assessments

3 Security & Compliance Assessments

"Testing is essential to the development process to promote confidentiality, integrity, availability, and resilience. Whether developed internally or by a third party, appropriate personnel should test systems and components to identify and correct defects before deployment, including security-related defects. […] The types of testing performed should be appropriate for the development activity's inherent risk. Effective management has a methodical process to define and conduct testing necessary to demonstrate the effectiveness of a developed system or component. Typically, testing is performed in stages, and knowledgeable testing specialists and relevant stakeholders should be involved in testing."

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THE SDLC | MAINTAIN

Improve Performance

Enhance Security

Correct Problems

"The maintenance and operations SDLC activities are necessary whether systems and components have been developed internally or by a third party. They include the routine servicing and periodic modification of everything needed for a system or component to run correctly including the network, hardware, system software, databases, and the related documentation. An entity's maintenance policies and procedures should include maintenance roles and responsibilities (which may include third-party roles and responsibilities), maintenance access policy (internal and remote), and maintenance monitoring and auditing mechanisms."

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THE SDLC | DISPOSE

1

End-of-Life / End-of-Support

(Examples: Windows 10 EOS, Post-Quantum Cryptography, FFIEC CAT Sunset)

2

Termination & Disposal

(Example: Morgan Stanley Hard Drives Disposal)

"When a system or component becomes obsolete, is no longer supported, no longer meets the users' or entity's needs, or becomes too costly to maintain, management may decide to terminate its use and dispose of the system or component. Effective management has appropriate termination and off-boarding procedures. The procedures should identify who has the responsibility to decide whether to terminate a vendor relationship, as well as an approval and acknowledgment process in which contracted parties agree to the relationship termination."

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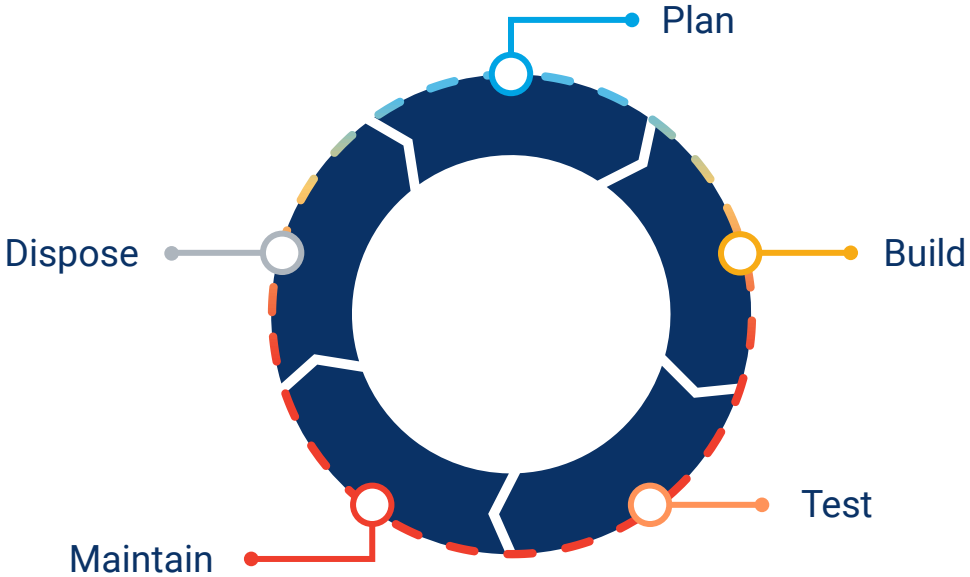
SYSTEM DEVELOPMENT LIFECYCLE (SDLC)



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If developers work for your organization, they need to have and follow a written system development life cycle (SDLC).

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DISCUSSION TOPIC

Do you have a formal SDLC?
What areas would you say are strongest or that need to be improved?

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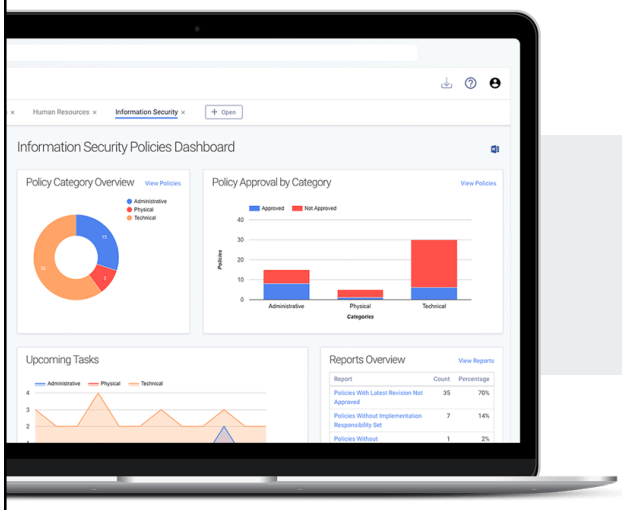

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Tandem Policies Software

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Integrated Components

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INTEGRATED COMPONENTS

- Open-Source Components
- Application Programming Interfaces
- Development Tools

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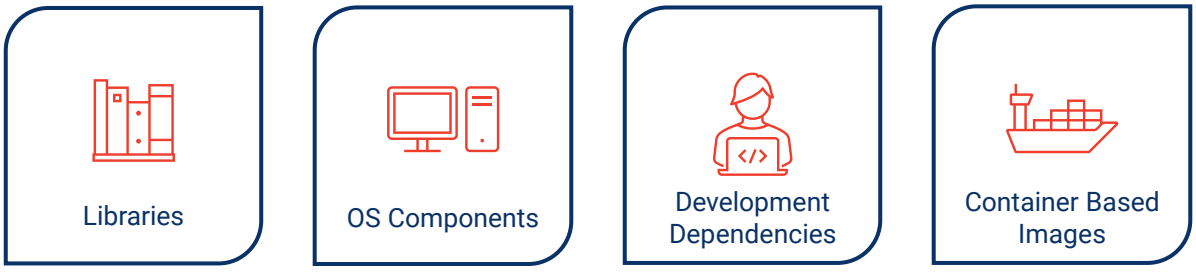
OPEN-SOURCE COMPONENTS



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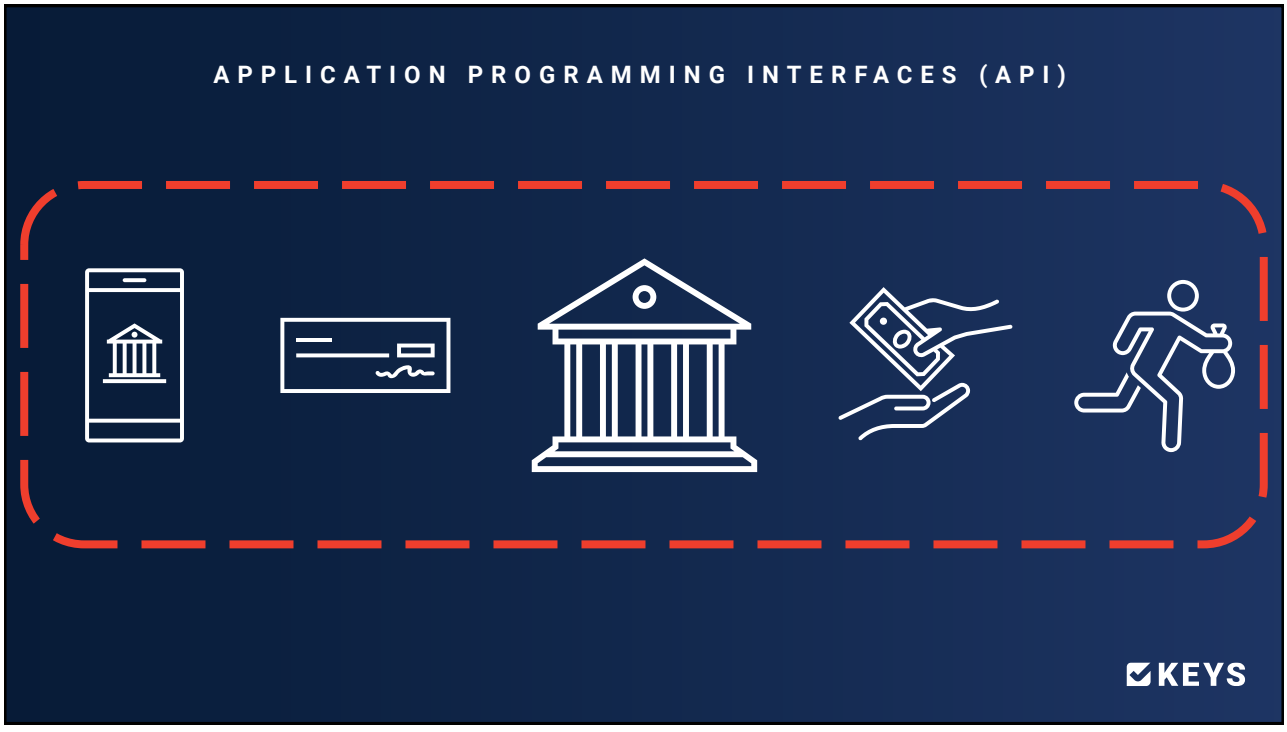
APPLICATION PROGRAMMING INTERFACES (API)
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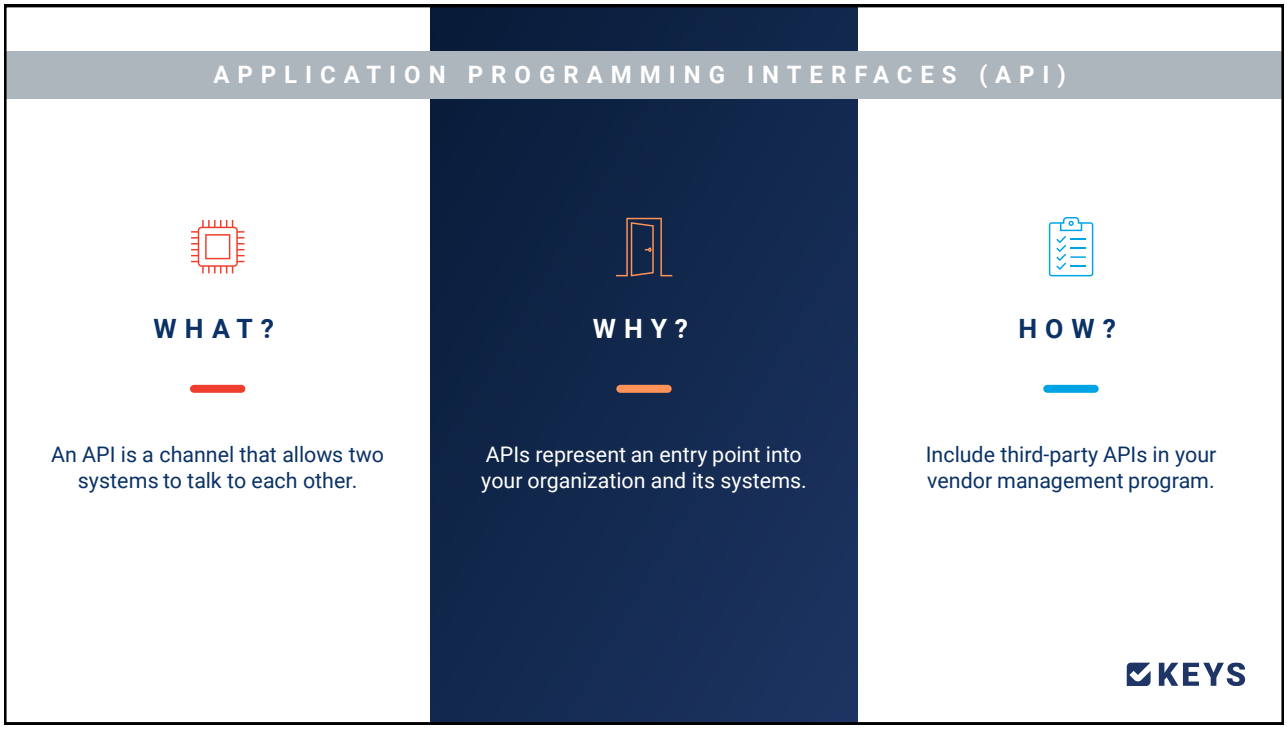
APPLICATION PROGRAMMING INTERFACES (API)
WHAT?
An API is a channel that allows two systems to talk to each other.
WHY?
APIs represent an entry point into your organization and its systems.
HOW?
Include third-party APIs in your vendor management program.
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First American Financial Corp. Leaked Hundreds of Millions of Title Insurance Records

May 24, 2019

The Web site for Fortune 500 real estate title insurance giant **First American Financial Corp.** [NYSE:FAF] leaked hundreds of millions of documents related to mortgage deals going back to 2003, until notified this week by KrebsOnSecurity. The digitized records — including bank account numbers and statements, mortgage and tax records, Social Security numbers, wire transaction receipts, and drivers license images — were available without authentication to anyone with a Web browser.

First American Financial Corp. Image: Linkedin.

https://krebsonsecurity.com/2019/05/first-american-financial-corp-leaked-hundreds-of-millions-of-title-insurance-records/

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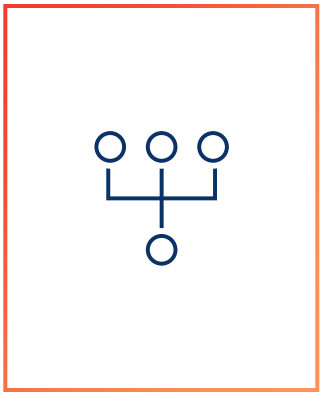
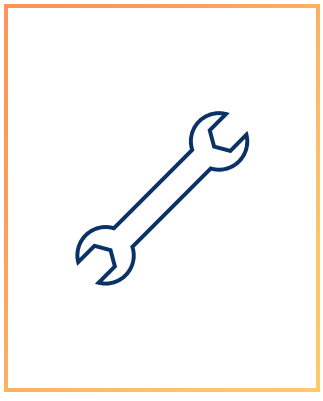
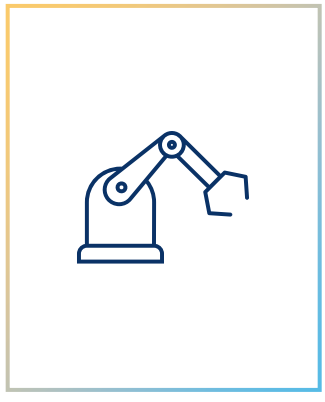
DEVELOPMENT TOOLS



Code Repositories



CI/CD Pipelines



AI Coding Assistants

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KEY TAKEAWAY

If components are accessing your data, then you need to treat them with the same level of review as you'd apply to a developer.

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Third-Party Risk Management

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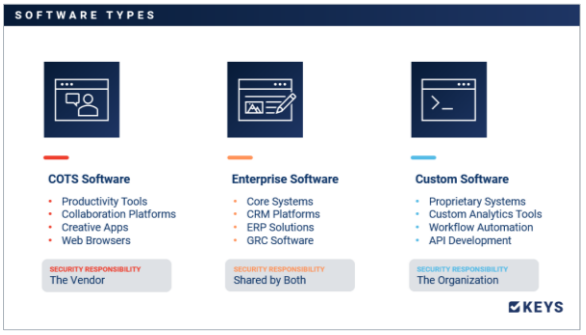
Buy
(Acquire)



Build
(Develop)

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Buy
(Acquire)

🤔 Do I trust this software or not?

CONTRACTS	DUE DILIGENCE
• Terms of Service	• SOC Reports
• Terms of Use	• Privacy Policies
• User Agreements (EULA)	• Certifications
	• Market Adoption

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TECHNOLOGY

Nebraska bank to settle MoveIt data breach for $2.4M

By Carter Pape

Published March 17, 2026, 5:14 p.m. EDT | Updated March 17, 2026, 5:14 p.m. EDT 5 Min Read

Aftermath of a breach

204,291
PEOPLE AFFECTED
Union Bank & Trust data breach

$2.4 million
SETTLEMENT AMOUNT
Preliminary class action agreement

Source: Court Filings

Visualization created with AI assistance based on original reporting

https://www.americanbanker.com/news/nebraska-bank-to-settle-moveit-data-breach-for-2-4m

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💛 **The Golden {Vendor} Rule**
Treat your vendors the way you would treat your own organization.

CONTRACTS	DUE DILIGENCE
• Intellectual Property	• SOC Report
• Service Level Agreement	• Privacy Policies
• Termination Contingency	• SDLC Documentation
• Escrow Agreement	• Vendor Management

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Build
(Develop)

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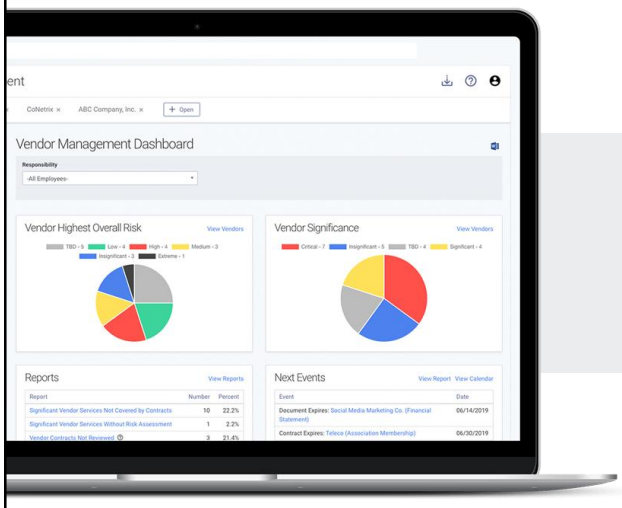

Tandem Vendor Management Software

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The Impact of Artificial Intelligence

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"We are only limited by our imaginations. And our tokens."

Aaron Hebert

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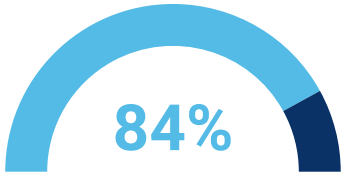
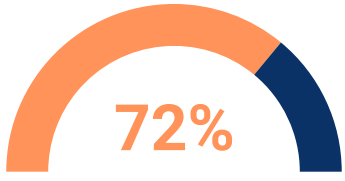
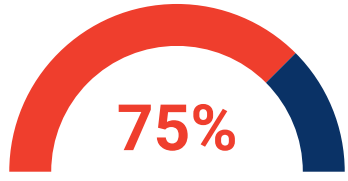
DEVELOPER SURVEY RESULTS



Developers who report using or planning to use AI in development



Developers who report not using AI to "vibe" code



Developers who say "When I don't trust AI's answers" is the top reason for involving human developers

SOURCE: Stack Overflow 2025 Developer Survey

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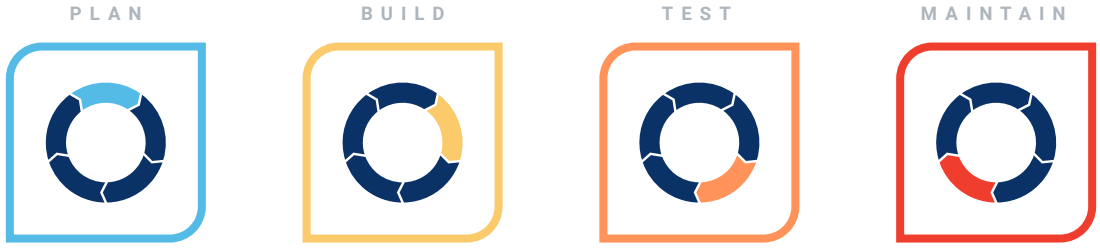
HOW AI IS IMPACTING SOFTWARE DEVELOPMENT



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FEATURE DESIGN

DEVELOPING SPECIFICATIONS

Translate business requirements into a draft specification, user stories or a data model.

Oversight is your control

BREAKING TASKS APART

Deconstruct large features into distinct development tasks via an implementation plan, before a developer writes any code.

Set your expectations

ASSIGNING TECHNICAL DEBT

Documenting and addressing maintenance tasks, so that changes may be easily addressed.

AI-generated = Tech Debt

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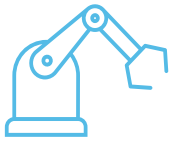
CODE AUTHORING



AI Coding Agents

Authoring ➡️ Directing

Repeatable Workflows

🚀 Boost Productivity

Documentation

🤔 What does the code do?

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CODE REVIEW

Reviewing Incoming Changes

Finding Vulnerabilities

Following Best Practices

🏅 Code review is a **quality** gate.

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BUG DETECTION

- How quickly will we find it?
- How thoroughly do we understand it?
- How confidently can we fix it?

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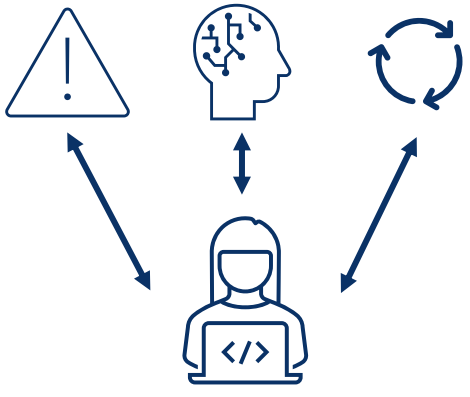
BUG DETECTION

"How did we get here?"

"Find the bug."



Model Context Protocols

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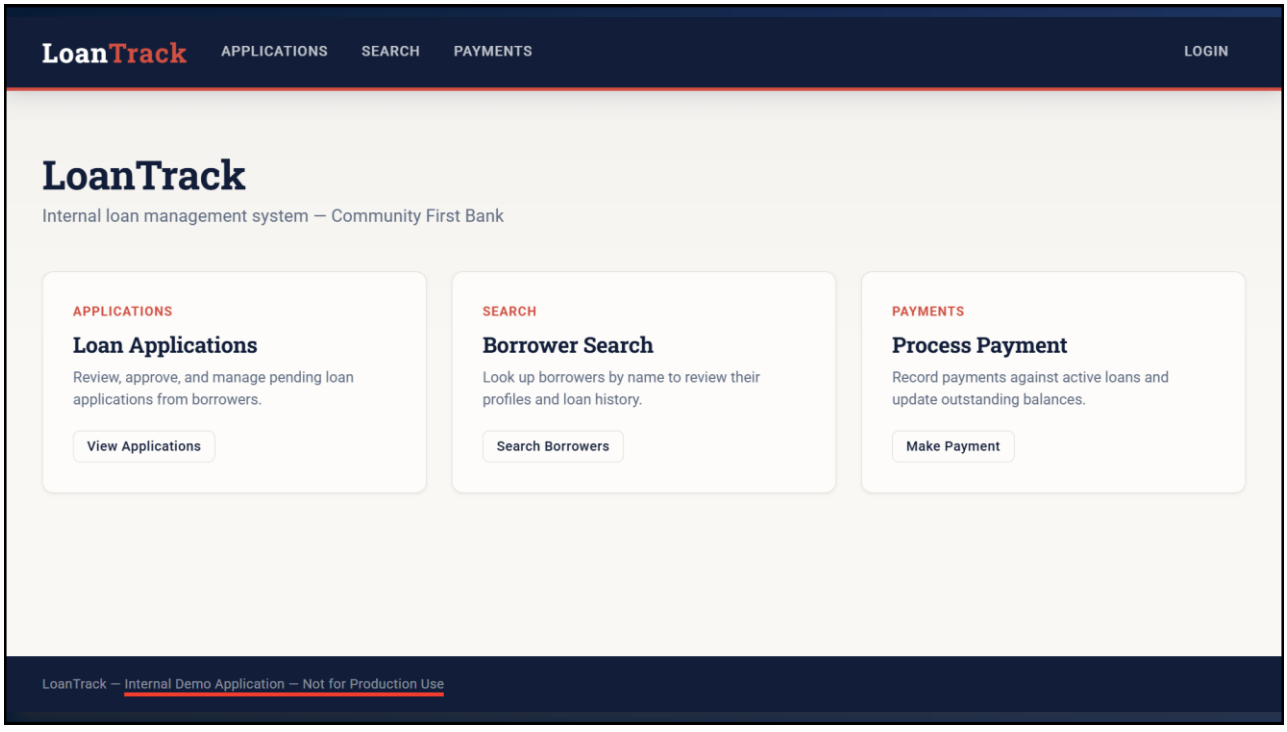

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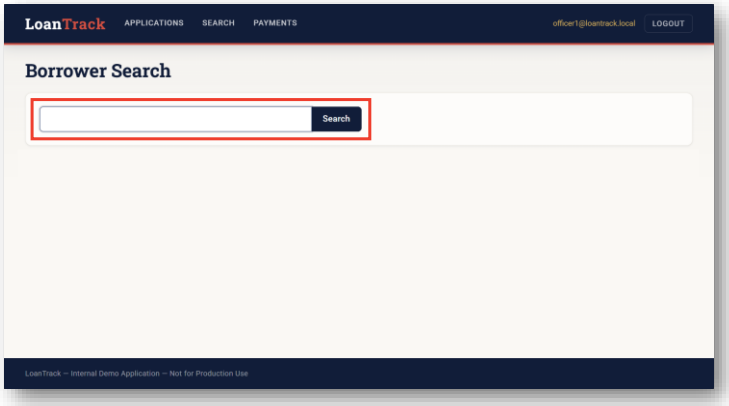
AI RISK | SQL INJECTION




```
SELECT *
FROM Borrowers
WHERE FullName LIKE '%" + name + "%'
```

An attacker enters a crafted search term and retrieves every customer record in the database, bypassing all authorization.

The borrower search function does not use parameterized queries. User-supplied input is concatenated directly into the database query string, creating an SQL injection vulnerability that could allow unauthorized access to all customer records.

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AI RISK | HARDCODED CREDENTIALS

```
"Server=prod-db.bank.internal; User Id=sa; Password=BankAdmin2026!"
```

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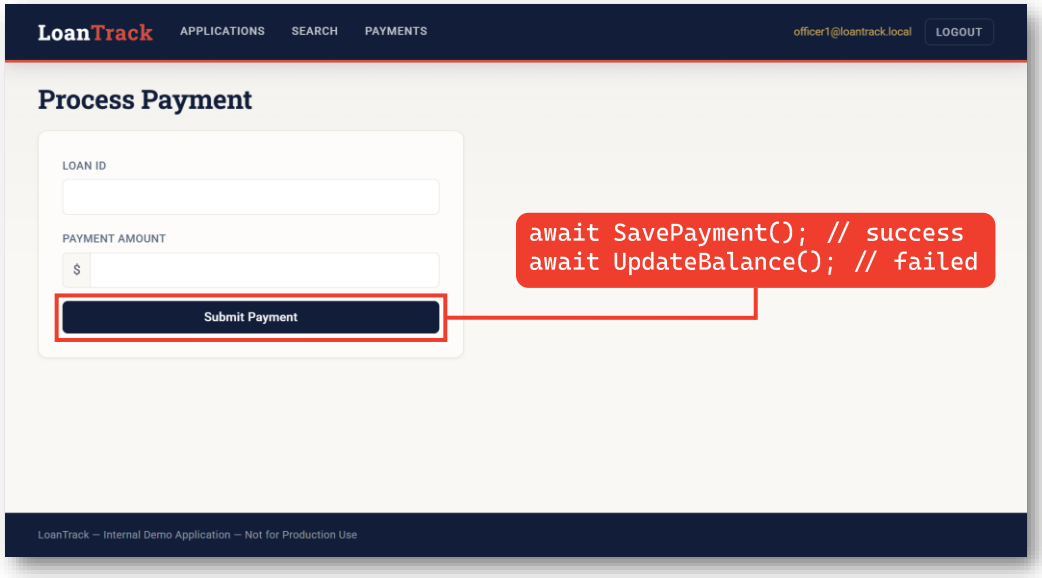
AI RISK | NON-ATOMIC PROCESSING



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DEVELOPER PROMPT	EXPLOIT
"Write a query to look up a borrower by name."	An attacker enters a modified search term and retrieves every customer record in the database, bypassing all authentication.
"Write a method to connect to the bank's database."	Every developer, contractor, or auditor with access to the source code repository can read the production database password.
"Write a method to process a loan payment and update the balance."	A payment is recorded as received, but the loan balance is never reduced. The customer is charged; the bank's records don't reflect it.

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ARTIFICIAL INTELLIGENCE | RISKS

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Data Exposure & Confidentiality

Attribution Gaps

Skill Erosion

Regulatory Blind Spots

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ARTIFICIAL INTELLIGENCE | CONTROLS

SAY NO TO PROD

Development tools stay in development.

SAY NO TO PII

✅ Production Code
❌ Production Data

FILL THE GAP

What does secure development look like in our environment?

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"Although AI agents are advancing rapidly, human expertise remains essential in software development. Programming is not software engineering. Even the most reliable systems cannot fully replace the judgment, creativity, and adaptability required to handle uncertainty, make complex decisions, and maintain security."

RUSSINOVICH AND HANSELMAN

https://dl.acm.org/doi/10.1145/3779312

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SESSION RECAP

1. Five Factors for Secure Software Development
2. The System Development Lifecycle (SDLC)
3. Integrated Components
4. Third-Party Risk Management
5. The Impact of Artificial Intelligence

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Fill out the survey to get your sticker!

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Thank You!

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