

Lessons Learned from Federal System Integrations: What Works, What Fails, and Why

Based on Real-world Case Studies, This Paper Shares Insights Into Common Risks and Proven Success Factors in Integrating Systems Across Federal Agencies.

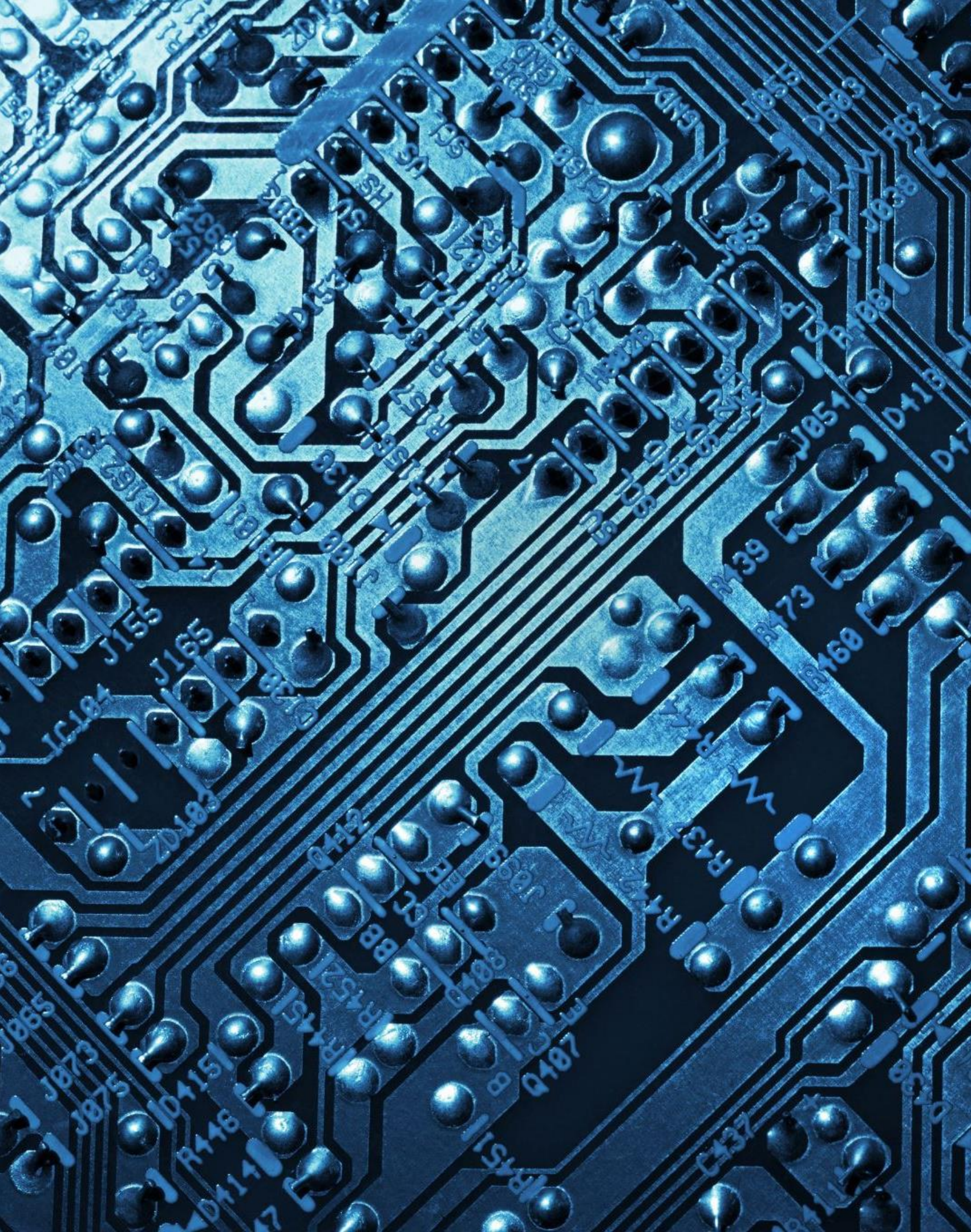
WHITE PAPER

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Executive Summary

- Federal system integrations are critical to delivering modern, citizen-focused services, yet they remain some of the most challenging undertakings in government. Over the past decade, agencies have pursued ambitious initiatives such as modernizing health records, transforming immigration systems, digitizing student aid, and expanding cross-agency data sharing. These efforts reveal a clear pattern: integrations succeed when lessons learned are continuously gathered, monitored, and applied; they fail when lessons are ignored, siloed, or treated as an afterthought.
- Programs such as the Department of Defense's MHS GENESIS and Customs and Border Protection's Automated Commercial Environment (ACE) show how phased rollouts, structured oversight, and real-time feedback loops can deliver resilient, scalable systems. In contrast, the VA's EHRM, USCIS ELIS, and the launch of HealthCare.gov highlight the risks of inadequate testing, weak governance, and the absence of systematic lesson-tracking. Recent challenges with the FAFSA modernization further underscore how failing to act on integration lessons can directly disrupt mission outcomes and harm public trust.
- The key insight is that technology alone does not determine success. What matters is the discipline of learning: embedding feedback into governance, linking lessons to performance metrics, and sharing insights across agencies. By institutionalizing lessons learned as a continuous management practice, federal leaders can avoid costly repetition of past mistakes, strengthen accountability, and accelerate modernization.
- This paper provides a set of actionable recommendations, from readiness assessments and incremental delivery models to interagency knowledge-sharing frameworks, that agencies can adopt to ensure future integrations are both resilient and citizen-centered. The lessons are clear: when government learns systematically, it succeeds; when it does not, it repeats failure.

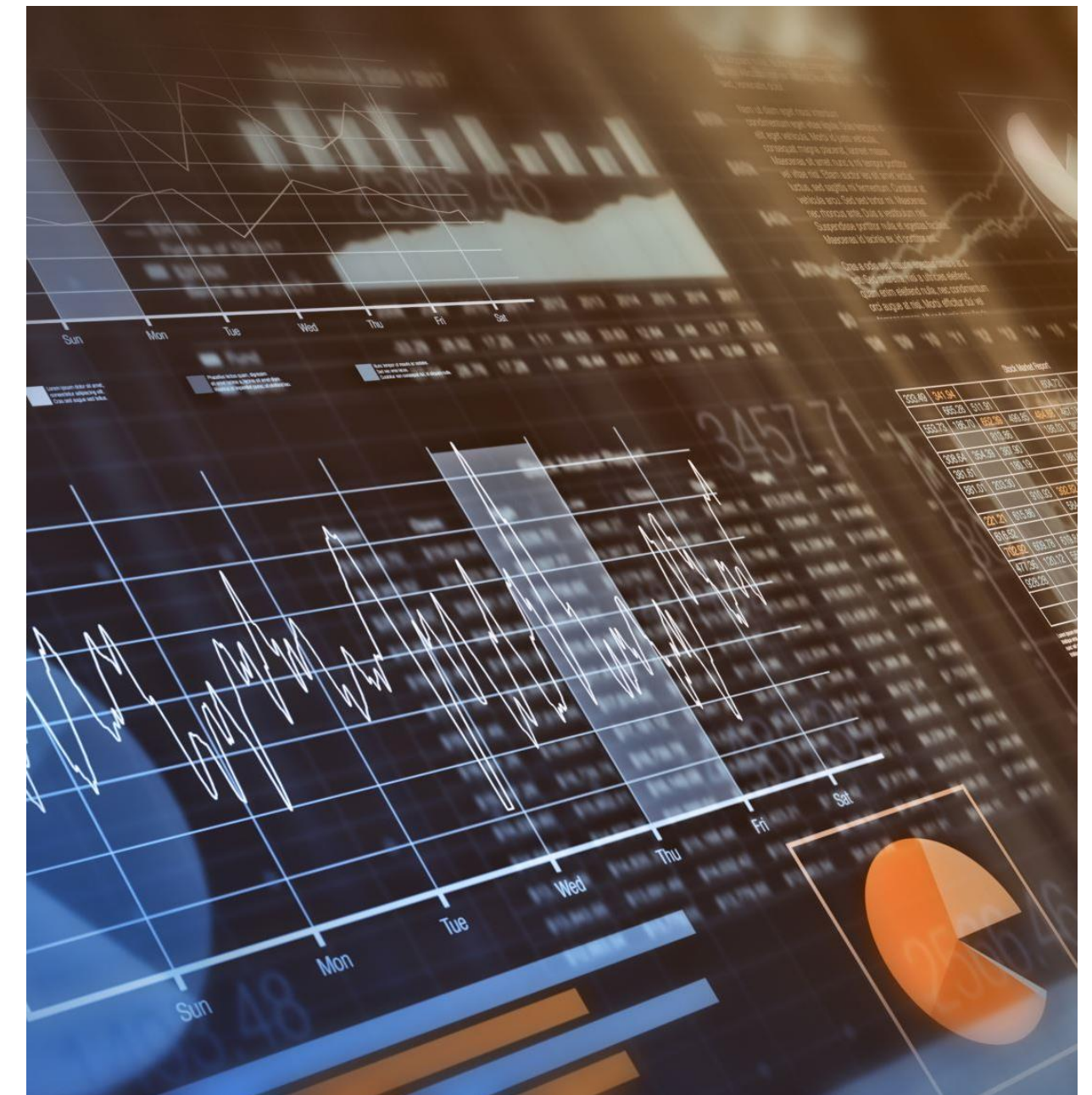


Context and Problem Statement

- Federal agencies increasingly depend on integrated systems to achieve mission outcomes, streamline operations, and meet transparency and compliance mandates. From financial management and trade processing to health records and identity verification, integration has become a cornerstone of modernization efforts across government. However, the path is rarely straightforward. Agencies face structural hurdles such as entrenched legacy systems, siloed data, fragmented procurement processes, and complex stakeholder environments that impact contractors, auditors, and the public.
- The central problem is that too often, agencies repeat the same mistakes because lessons learned are not systematically documented, shared, or institutionalized. Without a deliberate mechanism to capture what went right and what went wrong, valuable insights are lost when program teams disband, contractors change, or leadership turns over. This lack of continuity increases risk, wastes taxpayer dollars, and delays mission outcomes.

The Landscape of Federal System Integration

- Federal system integrations sit at the crossroads of mission delivery, technology modernization, and governance. Agencies pursue these efforts to reduce duplicative systems, strengthen efficiency, enable cross-agency data sharing, and comply with transparency and security mandates. At their peak, integrations create unified platforms that lower costs, improve service delivery, and ensure decision-makers have access to accurate and timely information. For instance, ACE has modernized trade processing, while the MHS GENESIS electronic health record has enhanced healthcare delivery for service members (GAO, 2018; GAO, 2024).
- However, the federal integration environment also contains several risks. Agencies often rely on legacy IT systems (some of which are decades old), that require costly customization when integrated with modern platforms. Long federal procurement cycles further limit agility compared to private-sector IT, making it difficult to adopt incremental and adaptive approaches. Oversight entities such as GAO have repeatedly flagged recurring issues with governance, contractor accountability, and change management, which lead to delays, cost overruns, and failures (GAO, 2025).
- The stakeholder environment adds another layer of complexity. Integrations rarely involve a single agency; instead, they require collaboration across federal departments, state and local partners, oversight bodies, contractors, and end-users. When stakeholders are aligned around shared requirements and governance structures, integrations succeed. When they are misaligned, whether in setting requirements, defining accountability, or prioritizing usability, programs often run idle or fail.
- In short, the federal integration landscape is both opportunity-rich and risk-heavy. The difference between success and failure lies in how well agencies align governance, adopt shared standards, and manage complex stakeholder dynamics.



Lessons Learned Examples: What Works

1. Department of Defense's MHS GENESIS (Electronic Health Record)

A core lesson from MHS GENESIS was the importance of ongoing performance monitoring and user feedback loops. DoD used phased deployments across waves of military treatment facilities to gather structured lessons learned at each stage. GAO noted that system performance issues, user training challenges, and integration defects were identified early and tracked through iterative assessments. This allowed corrective actions to be applied before scaling to additional sites. The requirement to monitor adoption metrics and user satisfaction at each wave reinforced the value of treating lessons learned as a live input to decision-making, not a static afterthought (GAO, 2021; GAO, 2024).

2. CBP's Automated Commercial Environment (ACE)

ACE succeeded in large part because CBP instituted a formal oversight and reporting process to Congress, which required the program to gather and document lessons learned on costs, schedules, and interagency coordination. These reports forced the agency to publicly acknowledge gaps and progress, ensuring transparency and accountability. By embedding these reporting requirements into the program structure, CBP institutionalized lessons learned as a compliance mechanism, helping it correct early schedule and cost overruns while building a sustainable governance framework (CBP, 2017).

3. FBI's Sentinel Case Management System

Sentinel's turnaround illustrates the power of adaptive monitoring and requirements refinement. After the Virtual Case File failure, the FBI implemented agile methods that required continuous backlog reprioritization, sprint reviews, and user feedback collection. Each sprint became a mechanism to capture lessons learned on functionality, vendor performance, and integration quality. Independent oversight reviews also documented progress and flagged risks, helping leadership refine requirements midstream. By codifying lessons into agile monitoring rituals, the FBI turned a high-profile failure into a system that ultimately delivered on its mission goals (GAO, 2007; FBI OIG, 2012; CMU/SEI, 2017).



Lessons Learned Examples: What Fails

1. VA's Electronic Health Record Modernization (EHRM)

The VA's EHRM has been repeatedly criticized for unresolved technical defects, cost overruns, and low user satisfaction. GAO reports found that while issues were documented, they were not consistently tracked against performance measures, and lessons from early deployment sites were not systematically applied to later rollouts. The lack of an enforced mechanism to monitor and institutionalize lessons learned led to repeated problems across sites, adding to delays and costs (GAO, 2014).

2. U.S. Citizenship and Immigration Services (USCIS) Transformation / ELIS Program

USCIS aimed to modernize its paper-based immigration system, but GAO found it failed to consistently adhere to systems integration practices and did not apply feedback from testing into development. Lessons were gathered inconsistently and not incorporated into requirements management, leading to defects that persisted after release. Without structured monitoring and feedback loops, integration problems escalated into systemic inefficiencies and program delays (GAO, 2016).

3. HealthCare.gov (2013–2014 Launch)

The rollout of HealthCare.gov is perhaps the most visible federal IT failure of the past decade. Investigations showed that fragmented acquisition planning and inadequate end-to-end testing meant that defects identified in one component were not aggregated or tracked across the system. The absence of a centralized monitoring process for lessons learned prevented early warning signs from being acted upon. Only after the failed launch did agencies implement structured governance and vendor accountability measures to stabilize the platform (GAO, 2014; HHS OIG, 2016).

4. FAFSA Modernization (2024–2025)

The Department of Education's effort to modernize FAFSA introduced significant disruptions when integration defects between the Education Department and IRS data transfers caused delays in student aid processing. GAO found that testing processes lacked clear mechanisms for capturing and applying lessons from early integration failures. Monitoring was reactive rather than proactive, meaning that by the time issues were detected, millions of students were already affected. The absence of a structured "lessons learned feedback loop" illustrates how integration failures can scale when oversight is passive instead of continuous (GAO, 2024).

Key Factors for Documenting and Collecting Lessons Learned



Make it continuous – capture lessons at every phase (pilot → rollout), not just at project close.

Use structured tools – dashboards, sprint reviews, after-action reports, and user surveys.

Track against performance metrics – link lessons learned to KPIs and hold leadership accountable.

Share broadly – use repositories and interagency councils to prevent knowledge silos.

Focus on adoption as much as tech – include stakeholder alignment, vendor management, and user feedback.



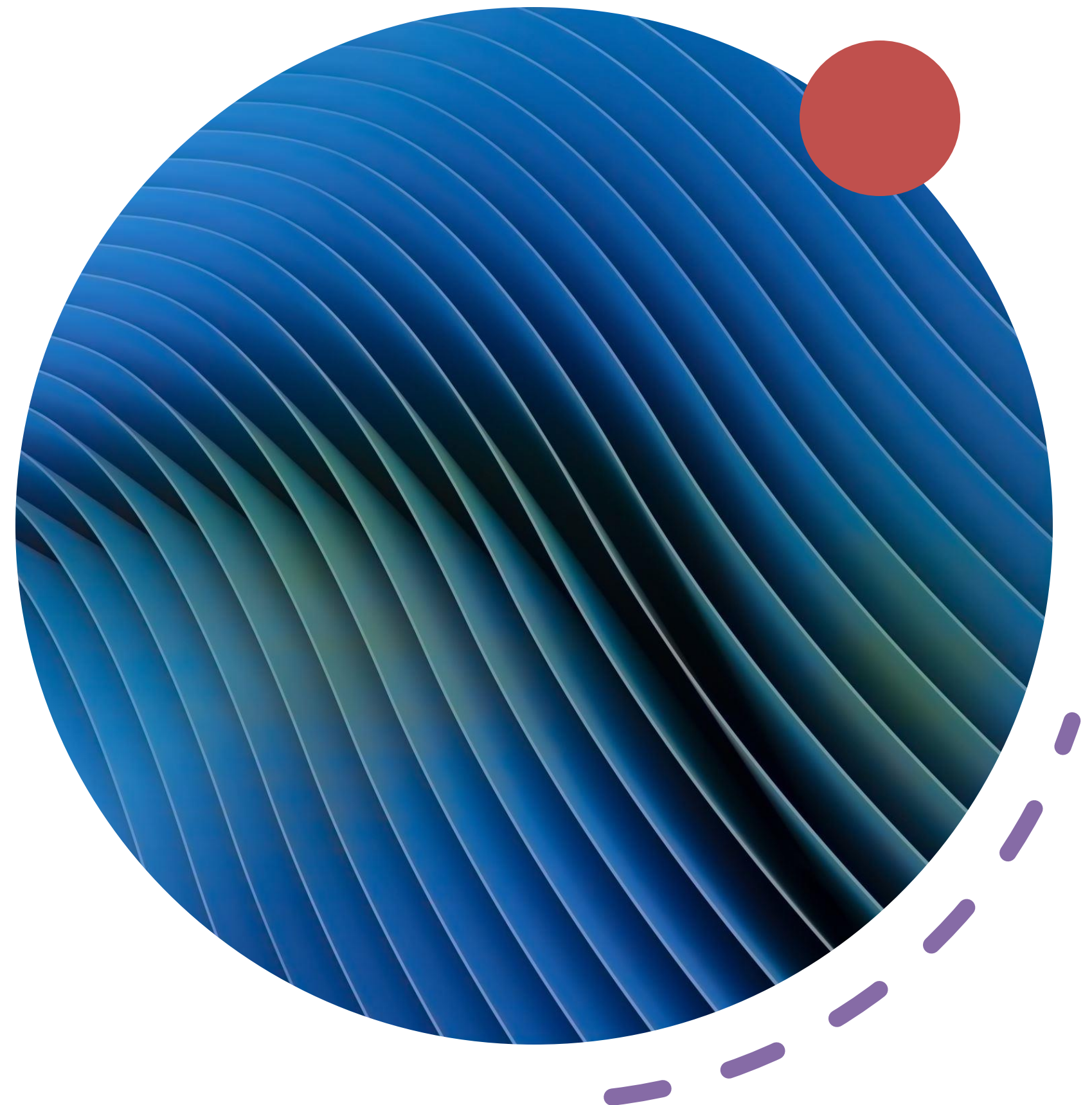
End-only collection – don't wait until closeout to document issues.

Checkbox exercises – lessons learned must be applied, not just filed away.

Siloed reporting – avoid contractor-only or team-only documentation that never informs leadership.

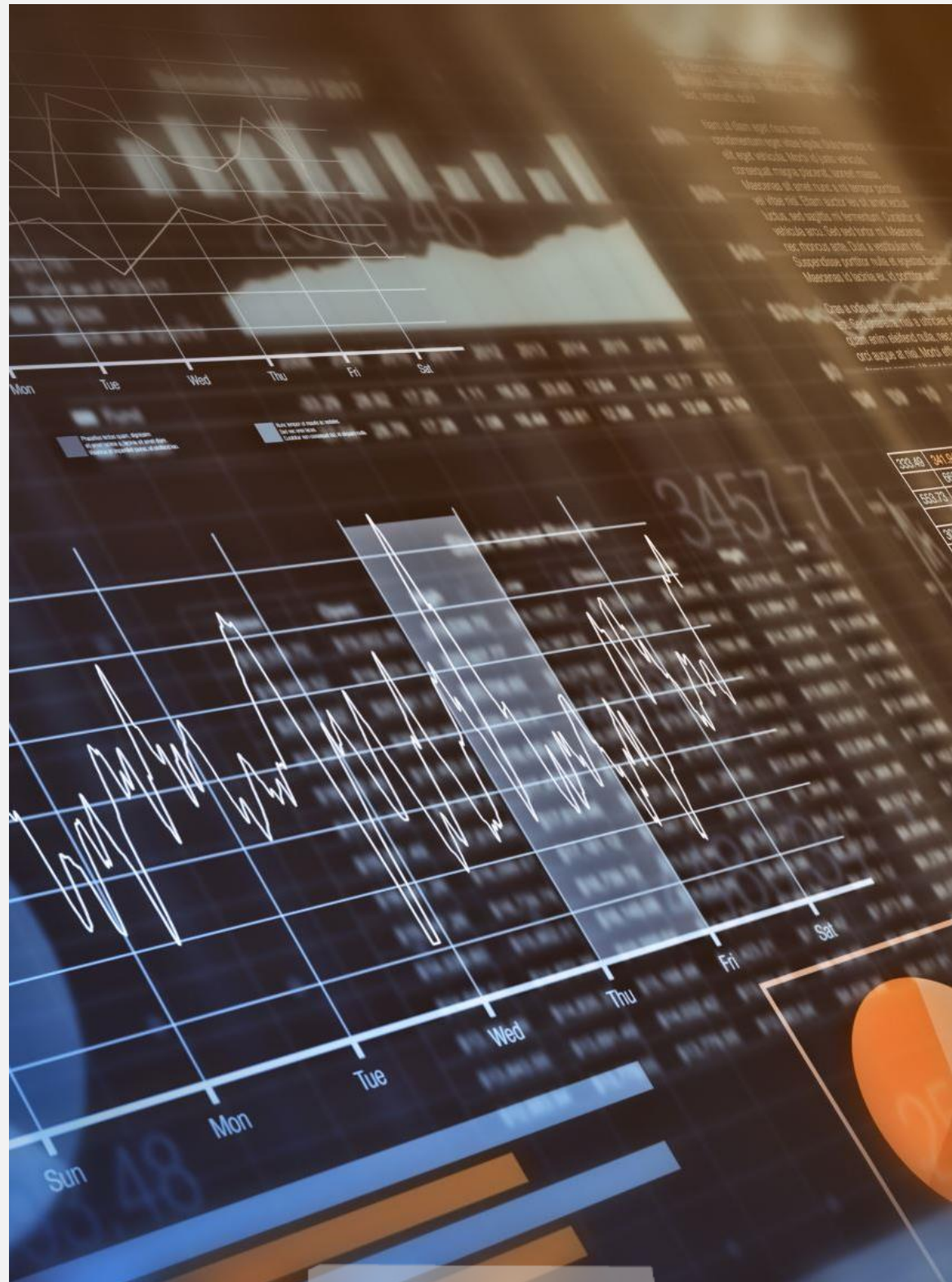
Narrow scope – don't limit lessons to technical glitches; capture organizational and cultural factors.

Reactive approach – build lessons into proactive monitoring, not just post-failure analysis.



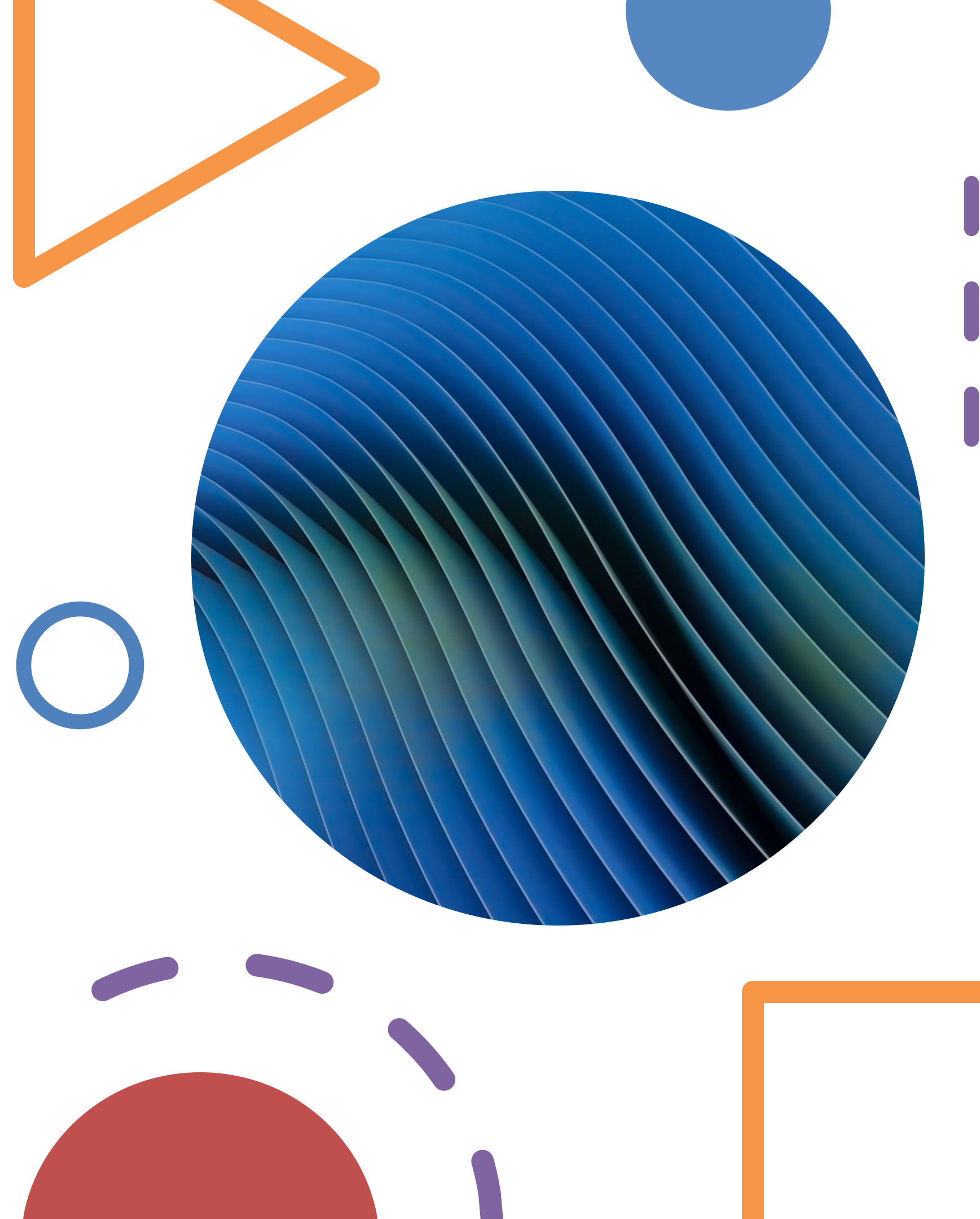
Recommendations for Future Federal Integrations

- The most consistent finding across federal system integration efforts is that lessons learned are not optional. They are essential for avoiding repeated failures and achieving mission success. Programs that institutionalize the collection and monitoring of lessons learned can spot early warning signs, adapt course, and prevent small issues from snowballing into systemic breakdowns.
- Agencies should therefore establish mandatory mechanisms for documenting and monitoring lessons learned throughout the project lifecycle. This means embedding tools such as dashboards, after-action reviews, and sprint retrospectives into governance structures, not just conducting ad hoc reviews at the end. Critically, lessons must be linked to performance metrics and reviewed by leadership, so they drive accountability and continuous improvement.
- Programs like ACE succeeded in part because congressional reporting forced the agency to capture and act upon lessons at each stage. By contrast, failures such as HealthCare.gov and the FAFSA modernization show what happens when lessons learned are collected too late or not applied systematically.
- In both cases, defects and integration gaps were identified but not aggregated or escalated, allowing problems to cascade until the public rollout failed.
- These examples underscore the risks of treating lessons learned as an administrative checkbox rather than a living process of organizational learning.
- Moving forward, agencies should:
 - Institutionalize lessons learned as a requirement in governance frameworks.
 - Monitor lessons in real time through KPIs, dashboards, and oversight reviews.
 - Share insights across agencies to prevent duplication of mistakes and accelerate modernization.
 - Tie lessons to procurement and vendor management, ensuring accountability for outcomes.



Conclusion

- Federal system integrations remain among the most complex and high-stakes initiatives in government. As the case studies show, when agencies adopt structured governance, phased delivery, and mechanisms to capture and apply lessons learned in real time, integrations can deliver significant benefits from modernized health records to streamlined trade systems. Conversely, when lessons are ignored, gathered too late, or siloed, programs risk repeating past mistakes, leading to delays, wasted resources, and public frustration.
- The path forward is clear: agencies must treat lessons learned as a core management discipline, not a final report. By embedding continuous feedback loops, linking lessons to performance measures, and sharing insights across agencies, the federal government can strengthen accountability, reduce costs, and accelerate modernization. Ultimately, the difference between success and failure in system integration is not technology alone. It's the ability to learn, adapt, and institutionalize knowledge. Agencies that commit to this discipline will be best positioned to deliver resilient, citizen-centered systems that advance mission goals and build lasting public trust.



References

- [GAO. \(2018\). *Automated Commercial Environment: CBP Has Made Progress but Challenges Remain* \(GAO-18-271\). U.S. Government Accountability Office.](#)
- [GAO \(2024\). *Electronic Health Records: DOD Has Deployed MHS GENESIS, but VA Continues to Face Challenges with Its System* \(GAO-24-106187\). U.S. Government Accountability Office.](#)
- [GAO. \(2025\). *Electronic Health Record Modernization: VA Needs to Improve Governance and Address System Defects* \(GAO-25-108091\). U.S. Government Accountability Office.](#)
- [GAO. \(2021\). *Electronic Health Records: DOD Has Begun Phased Deployment of MHS GENESIS and Improved System Performance, but Challenges Remain* \(GAO-21-571\).](#)
- [GAO. \(2024\). *Electronic Health Records: DOD Has Deployed New EHR System, but User Satisfaction, Module Issues Remain* \(GAO-24-106187\).](#)
- [CBP. \(2017\). *Automated Commercial Environment – FY 2016 Third and Fourth Quarters Report to Congress.*](#)
- [GAO. \(2007\). *FBI: Following a Number of Key Acquisition Practices on Its Sentinel Project* \(GAO-07-912\).](#)
- [FBI Office of Inspector General. \(2012\). *Interim Report on the FBI's Implementation of the Sentinel Case Management System.*](#)
- [Software Engineering Institute, Carnegie Mellon University. \(2017\). *Agile Project Success and Failure: The Story of the FBI Sentinel Program.*](#)
- [GAO. \(2014\). *Healthcare.gov: Ineffective Planning and Oversight Practices Underscored the Importance of Properly Managing IT Acquisitions* \(GAO-14-694\).](#)
- [GAO. \(2016\). *USCIS Transformation: Improvements Needed to Ensure System Adequately Supports Transformation Goals* \(GAO-16-467\).](#)
- [HHS OIG. \(2016\). *HealthCare.gov: CMS Management of the Federal Marketplace* \(OEI-06-14-00350\).](#)
- [GAO. \(2024\). *Federal Student Aid: FAFSA System Modernization—Education Needs to Address Challenges to Ensure Timely Delivery* \(GAO-24-107407\).](#)