

Contact Information

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1. Section 4 – Understanding and Approach to QA Services

1.1 Sub-Section 5.2.3.1 – Quality Assurance Staffing

1.1.1 Understanding and Approach 1

1.1.1.1 Understanding of CalSAWS Quality Assurance Staffing

Team Infosys understands the unique Quality Assurance (QA) staffing requirements associated with complex, government regulated systems being supported by multiple vendors. The CalSAWS ecosystem requires vendors willing to operate as a highly collaborative and seamless team while bringing innovative solutions forward to fulfill the ever-changing regulatory mandates. As these changes evolve over time, our team recognizes the need to adapt to altered requirements and newer technology platforms while continually enhancing the customer experience and reducing routine workloads for the State and County staff. As such, Team Infosys uses continual process improvement techniques, robust technology training and clear adherence to governance structures to deliver the benefits. Our CMMI Level 5 appraised status guides us in our ongoing process improvement efforts while our technology training provides the insight for our staff to deliver innovative ideas. Our experience supporting other state-run Health and Human Services (HHS) agencies as well as our prior direct support to the Consortium enable our QA team to provide collaborative recommendations aligned to regulatory constraints.

1.1.1.2 Approach

Based on our prior CalWIN support, our team fully recognizes the CalSAWS Project as a complex and evolving statewide system that must continually adapt to new policies, compliance mandates, technological advancements, evolving security threats, and stakeholder needs. Our approach fulfills the requirements by providing a unique, purpose-built team with the ability to adjust over the life of the contract as necessitated by evolving requirements. This includes recognition that QA within this environment requires more than static testing - it demands a forward-looking staffing approach. Our approach includes not only the selection of experienced candidates but also includes continual training that ensures the team is equipped for current validation needs and the ability to adjust to future changes such as:

- Policy and regulatory updates (federal/state mandates, county-level variations).
- Technology transformations (cloud adoption, modernization, integration with digital platforms).
- Shifts in user experience expectations and accessibility requirements.
- Evolving security threats
- Program expansion, vendor transitions, or multi-county operational environments.

Team Infosys approaches this challenge with a future-ready QA team that blends deep domain knowledge, adaptive staffing models, and expansive skillsets that are ready to work as part of a cohesive team with the umbrella organization built by the Consortium. The Team Infosys staffing approach for the QA Team within the CalSAWS environment is uniquely designed to ensure adaptability, resilience, and continuous improvement in response to future changes. Here's how the approach stands out:

Domain-Aligned Resource Pool

A domain-aligned resource pool for eligibility systems enables Infosys to ensure its QA resources bring specialized, hand-on expertise in government eligibility and welfare benefit systems. This

capability accelerates onboarding, fosters compliance, and boosts responsive as requirements evolve.

Key Features

Team Infosys brings deep expertise in managing California's state eligibility programs, including CalWORKs, which provides cash aid and supportive services to eligible families; CalFresh, offering food benefits to low-income individuals and households; and Medi-Cal, delivering comprehensive health coverage to qualified residents. Our experience extends to foster care programs for children placed in care, refugee assistance that includes cash and employment services for resettling refugees, and the County Medical Services Program (CMSP), which offers health coverage for low-income adults who do not qualify for Medi-Cal. Additionally, we handle General Assistance and General Relief programs, county-funded initiatives that provide cash aid to adults without dependent children who are ineligible for other assistance.

The Infosys pool of QA professionals for the CalSAWS Project have practical experience in eligibility determinations such as DCAS (District of Columbia Access System) for Washington DC, CalWIN (California Work Opportunity and Responsibility to Kids Information Network) for CalWIN counties, and Connecticut's ImpaCT, ConneCT, and AHCT systems as well as prior CalSAWS QA and business analyst experience. These platforms support eligibility and benefits determination for programs including Cash Programs (CalWorks), Food Stamp (CalFresh) and EBT program, Medicaid. Our proposed QA Team's specialization ensures a strong understanding of the complexities of public assistance systems, enabling them to proactively adapt to policy and regulatory changes with precision and efficiency.

Adaptive Skill Development/T-Shaped

The Team Infosys staffing approach includes using T-shaped profiles. A T-shaped profile refers to a professional's skill set characterized by deep expertise in one area (the vertical bar of the "T") and a broad understanding of other areas (the horizontal bar). As such, these profiles combine deep expertise in a specific QA domain with broad proficiency skills development among QA staff as a cornerstone approach for enabling the QA team to confidentially adapt to future changes. The goal is to cultivate professionals with both deep domain and IV&V expertise and broad cross-functional abilities thereby ensuring the team can seamlessly collaborate, adopt new practices, and respond to evolving CalSAWS requirements.

Infosys T-Shaped Skilling Model for QA

- **Deep Technical Specialization:** Infosys staff achieve expert-level capabilities within specific QA areas such as automation, performance, security, or accessibility testing, mastering tools and methodologies required for contemporary eligibility systems like CalSAWS.
- **Broad Collaborative Skills:** Infosys staff are trained in broader areas – CI/CD platforms, DevSecOps, business analysis-which fosters the ability to contribute to user story refinement, participate in pipeline automation, and support adjacent teams.
- **Change Readiness and Flexibility:** Infosys ensures continuous learning through targeted programs, certifications, micro-learning, and cross-functional project rotations. This culture of learning keeps QA staff agile and capable of absorbing new technologies, tools, or state policy changes affecting CalSAWS.
- **The Cross-training program:** We use a structured cross-training initiative as the mechanism that builds and expands this 'T-shaped' skill profile within the CalSAWS QA team.
- **Breaking down silos:** Instead of operating in functional silos, our cross-training facilitates our team members gaining hands-on experience in areas adjacent to their core

specialty. For instance, an automation tester receives training on California welfare policy changes and business impact analysis, while a business process tester is cross trained in interpreting automation reports and basic SQL queries.

- **Encouraging Knowledge Sharing:** Cross training fosters a culture of collaboration and mutual learning. We implement regular knowledge-sharing sessions, peer-led training, and team rotations where QA members temporarily embed themselves within different sub-teams to build broader experience.
- **Ensuring business continuity:** By minimizing reliance on a single subject matter expert (SME) for any given area, cross-training reduces the key-person absence risk. If a specialist is unavailable, another team member with cross-trained knowledge can step in, ensuring support coverage and project flow are not disrupted.
- **Adapting to future changes:** This flexible, T-shaped team is uniquely prepared for future changes within CalSAWS. Whether the change involves a new regulatory policy, a system upgrade, or a shift in technical architecture, our cross-trained QA team can quickly pivot to validate the impact and ensure quality across all affected modules and activities. This is a critical advantage over teams with rigid, specialized skill sets.
- **Problem-Solving and Innovation:** As a result of our T-shaped QA staffing approach, our team is well-situated in proposing improvements beyond their specialization, bridging QA, Operations, and the CalSAWS Project objectives. Further, this approach demonstrates our value as a partner committed to ongoing modernization and evolution as requirements dictate.

The Team Infosys focus on T-shaped skills development proactively aligns our QA team with the needs of a rapidly changing CalSAWS environment, equipping our staff to address the future with confidence and agility.

Table 1 below illustrates how the T-shaped cross-training approach differs from other QA staffing models.

Table 1. Advantages of the T-Shaped QA Staffing Model

Differentiating Factor	T-Shaped Profile QA Model	Traditional QA Model
Skill Focus	Deep expertise in one area (e.g., test automation) combined with broad knowledge of related areas (e.g., California welfare policy).	Deep expertise in only one specific area. These are the "gurus" who know one thing exceptionally well.
Flexibility	High – resources can switch roles/tasks as priorities change.	Low – rigid roles; requires additional hiring for new skill needs.
Scalability	Easier to scale without adding headcount; cross-trained team absorbs workload shifts.	Scaling requires onboarding new specialists for each skill gap.
Adaptability	High – Staff can shift focus as CalSAWS evolves, using their broad knowledge to address new technologies or policy changes.	Low – Specialists are less able to adapt or perform other QA tasks, creating bottlenecks when their specific skill set is not needed.
Knowledge Management	Built-in knowledge sharing via peer training, rotations, and a robust knowledge management process.	Knowledge is concentrated within a few individuals, creating single points of failure and vulnerability to employee turnover.

Collaboration	High – T-shaped QA staff understand the work of developers, business analysts, and others, leading to more effective communication and a holistic quality approach.	Low – A communication gap can occur between specialists and other team members who do not understand the technical nuances of the specialist's role.
Risk Mitigation	Strong – Redundancy is created through overlapping skills, reducing key-person risk and ensuring business continuity.	Weak – The team's reliance on one or two specialists can cause projects to stall if a key employee leaves or is unavailable.
Project Fit	Ideal for Agile, DevSecOps, and complex projects like CalSAWS that require frequent changes and a continuous learning culture.	Best for Waterfall or traditional, sequential projects with static requirements where a predictable testing phase is acceptable.
Cost Efficiency	Lower overall cost due to multi-skilled resources.	Higher cost due to multiple specialized roles.

Scalable Staffing Model for CalSAWS

CalSAWS is a continuously evolving platform with frequent policy updates, integration requirements, and statewide rollouts. To ensure quality and timeliness, Team Infosys proposes a scalable staffing model that is engineered to provide maximum flexibility and efficiency, ensuring the right talent is deployed precisely when and where it is needed. Instead of a static team, our approach combines a stable core team with a flexible surge capacity, enabling seamless adjustment to the dynamic needs of the CalSAWS environment. This agile model allows for rapid scaling during peak periods, such as major system upgrades, policy-driven changes, or county transitions, while remaining cost-efficient during steadier operational phases.

The framework is detailed as follows:

- **Core Team:** A dedicated, cross-trained core of QA specialists provides consistent, high-quality support and maintains deep institutional knowledge of CalSAWS. This team is responsible for ongoing QA (Quality Assurance) activities and critical business continuity tasks. Their T-shaped skills profile allows them to manage routine changes and quickly adapt to evolving project needs. As submitted, our proposal includes this core team.
- **Flexible Capacity Pool:** Infosys maintains a readily accessible pool of qualified resources including contingent workers, specialized contractors, and internal Infosys talent who can be rapidly deployed to address increases in workload or specific skill gaps. This allows us to scale up our QA team on-demand for specific projects or during periods of increased testing demand without incurring the cost of permanent full-time employees for temporary needs. As needed, this capability can be leveraged by the Consortium.
- **Proactive Talent Management:** Our proactive approach involves continuous talent mapping and relationship nurturing to ensure a robust pipeline of skilled QA professionals. By leveraging internal AI-driven tools, we can quickly identify and mobilize resources with the right skills and experience, reducing recruitment lead times by as much as 50%. This ensures that when a new need arises—for example, a change impacting a specific California welfare program like CalFresh—we have pre-vetted specialists ready to onboard and contribute immediately.
- **Strategic Staffing Alignment:** The staffing model is continuously aligned with CalSAWS's business goals and projected timelines. Through a collaborative planning process, we analyze project roadmaps, historical data on workload spikes, and upcoming

regulatory changes to forecast resource needs. This allows us to preemptively position resources and training, ensuring our QA team is always prepared for what's next. This strategic foresight protects against delays, maintains quality, and avoids the common pitfalls of reactive staffing.

QA Staffing for Evolving Security Threats in CalSAWS

Team Infosys recognizes that CalSAWS, as a statewide welfare eligibility and case management system, operates in a highly sensitive data environment – one that handles personally identifiable information (PII), financial data, and confidential case details. This makes the system a continuous target for evolving security threats, ranging from ransomware and phishing to zero-day vulnerabilities and insider risks. Our QA staffing model is designed not just to address current threats, but to anticipate, adapt, and proactively address emerging security risks across the system lifecycle.

Embedding Security as a Core QA Competency

Infosys positions security assurance as an integral layer of QA, not an afterthought. Each QA team includes Security-skilled QA Engineers trained in:

- Secure coding principles (OWASP Top 10, NIST 800-53, FedRAMP controls)
- Static and dynamic application security testing (SAST, DAST).
- Penetration testing, vulnerability scanning, and API security validation.
- Data privacy validation aligned to HIPAA, IRS 1075, and state security mandates.

This ensures that QA staff can validate not just functional correctness, but also resilience against evolving threat vectors.

Continuous Upskilling & Threat Intelligence Integration

Evolving threats require QA teams to continuously upgrade their knowledge base. Infosys leverages:

- Infosys Cybersecurity Academy & Infosys Wingspan for ongoing training in cloud security, DevSecOps, and AI-driven threat modelling.
- Threat intelligence feeds (via partnership with global cybersecurity vendors) to keep QA teams updated on the latest attack patterns.
- Quarterly red-team/blue-team simulation workshops allow QA testers to validate how other systems, similarly, configured to CalSAWS defense mechanisms, function in near-real-world attack conditions.

DevSecOps-Driven QA staffing

Team Infosys integrates QA roles directly into the CalSAWS DevSecOps pipeline:

- **Shift-left Security testing:** QA resources execute automated security checks during the build stage to catch vulnerabilities early.
- **Continuous Integration Security Testing (CIST):** Every code check-in undergoes automated SAST/DAST scans.
- **Automated Regression Packs with Security Assertions:** Our test suites include reusable libraries that validate security configurations (e.g., access control, encryption in transit/at rest).

Proactive Adaptability for Evolving Threats

Infosys positions its QA staff to be future-ready through:

- **Flexible Resource Allocation:** Rapid scaling of security-skilled QA staff during heightened threat alerts.
- **Cross-skilled QA Engineers:** Testers trained both in functional QA and security testing to avoid silos.
- **Security-as-code Adoption:** QA engineers use automated scripts that evolve with each patch update, ensuring continuous protection against new vulnerabilities.

Governance & Continuous Monitoring

Team Infosys establishes a Security QA Governance Board integrated with CalSAWS security leadership. Key features include:

- Monthly security QA dashboards high-lighting vulnerable trends, patch effectiveness, and residual risks.
- Compliance validation against California state mandates and federal security frameworks.
- SLA-driven staffing commitments to ensure timely threat mitigation testing during security incident response.

Through the above approach, Team Infosys ensures that its QA staffing is not static, but dynamic and future oriented. By embedding security skills, continuous threat awareness, and adaptive resourcing, Infosys enables CalSAWS to maintain a secure, compliant, and resilient system environment despite the rapid evolution of cyber threats.

Driving Innovation Through QA Staffing

Team Infosys uses a strategic and adaptive staffing approach that positions our QA team to handle future changes in the CalSAWS environment effectively. This proactive change readiness approach for our QA staffing is designed not merely to absorb these changes but to act as both a driver and validator of innovation. Here's how the approach uniquely prepares the team:

Domain-Specific Expertise

Team Infosys assembled our QA team with deep knowledge of public assistance programs like CalWORKS, CalFresh, and Medicaid, as well as CalSAWS operational and compliance requirements. This ensures the team can quickly adapt to policy changes, new regulations, and evolving eligibility rules without a steep learning curve.

Flexible and Scalable Staffing Model

Infosys leverages strategic staffing principles to maintain agility. This includes:

- Blended workforce models (full-time, contingent, and specialized experts) to scale up or down based on project phases.
- Proactive workforce planning to anticipate future needs, such as system migrations or new federal mandates.

Continuous Knowledge Management

Team Infosys uses structured knowledge transfer frameworks and repositories to retain institutional knowledge. This minimizes disruptions during staff rotations and ensures continuity in QA processes, even when team composition changes.

Next-Gen QA Practices

Team Infosys Next-Gen Managed QA Services include:

- Early automation (>50%) for independent, regression and compliance testing activities.

- Predictive analytics and early warning frameworks to identify risks before they impact operations.

Team Infosys adopts a proactive assurance model for Quality Assurance, ensuring that QA is not just a compliance function but also a business enabler. Our approach for CalSAWS leverages Next-Gen QA practices to anticipate and adapt to evolving requirements, regulatory changes, and technology shift. Key elements include:

1. Shift-Left and Early Automation

- Infosys integrate QA early in the SDLC through shift-left testing, enabling early defect detection, and reducing rework costs.
- Automation coverage exceeds 50% using AI-driven frameworks for functional, independent, regression, performance and compliance testing.

2. AI and Predictive Analytics

- Infosys employs AI-powered test optimization and predictive analytics to forecast defect-prone areas and prioritize testing efforts.
- Our Generative AI Test Platform accelerates test case design, data generation, and impact analysis for upcoming CalSAWS releases.

3. Domain-Centric Business Assurance Centers

- Dedicated Business Assurance Centers staffed with domain experts ensure compliance with CalSAWS' complex eligibility and benefit rules.
- Continuous monitoring of requirement volatility index and requirement quality index helps us adapt to policy and legislative changes swiftly.

4. Cloud-Ready and DevSecOps Integration

- Our QA approach aligns with CalSAWS' cloud migration roadmap, embedding security and compliance checks into CI/CD pipelines.
- We leverage DevOps and continuous testing to ensure rapid, risk-free deployments.

In summary, Team Infosys integrates training and change management frameworks to upskill our QA team on new tools, processes, and compliance requirements. This ensures rapid adoption of CalSAWS enhancements, cloud transitions, and policy-driven updates.

1.1.1.3 Prior Examples

Team Infosys provides two specific California-oriented examples of how our T-shaped staffing profiles approach and collaborative efforts provided tangible customer benefits. The first example below relates to our prior understanding of the prior CalWIN renewal processes and the second is associated with Temporary Homeless Assistance (THA). Team Infosys leveraged our deep experience in California's health and human services domain—particularly through its QA efforts on the CalWIN system—to strategically staff the QA team with professionals who not only possessed strong technical expertise but also a deep understanding of county operations and system interdependencies.

Example 1: Improved Medi-Cal Renewal Process

Previously, CalWIN counties faced significant challenges in processing Medi-Cal renewals efficiently. For example, Alameda County served over 500,000 Medi-Cal beneficiaries, while San Diego County served more than 1 million. Despite the dedication of county staff, low retention rates and budget constraints often result in staffing shortages, creating backlogs in renewal processing.

The auto-renewal process was implemented to help reduce this workload. The CalHEERS system interfaces with CalWIN to determine eligibility for MAGI Medi-Cal using e-verifications

such as income, incarceration status, and death records. However, CalWIN initially auto-renewed eligibility only when e-verifications were available, ignoring administrative verifications obtained by counties—even though these are acceptable for renewal. As a result, cases without e-verification required manual processing by county staff, adding to their burden.

To address this county staff pain point, Infosys collaborated with CalWIN and the M&O Vendor to recommend a critical enhancement:

- Update the auto-renewal logic to consider both administrative and e-verifications when determining eligibility.
- Stop relying solely on e-verifications from CalHEERS for income, death, and incarceration checks.

This change enabled greater automation, reduced manual intervention, and improved timeliness of Medi-Cal renewals, directly supporting counties in meeting compliance and service-level expectations. Infosys QA professionals, with deep expertise in California's eligibility systems, played a pivotal role in identifying and validating key enhancements:

- Updating auto-renewal logic to include both administrative and e-verifications.
- Reducing dependency on CalHEERS-only data, enabling broader automation.

This change was not just a technical fix, it was a QA-led transformation that improved operational efficiency, compliance, and member experience.

How Staffing Enabled Future Readiness

The Team Infosys staffing approach ensured that our QA resources were:

- Cross-trained across CalWIN and CalHEERS, enabling seamless collaboration and system understanding.
- Experienced in scalable automation frameworks, allowing enhancements to be tested and validated for portability to CalSAWS.
- Embedded with county operations knowledge, ensuring that QA validations reflected real-world scenarios and compliance needs.

Preparing for CalSAWS

The QA team's work in CalWIN laid the foundation for CalSAWS readiness by:

- Designing extensible test harnesses and rules engines that could be reused in CalSAWS.
- Establishing governance dashboards and early warning triggers to monitor performance and SLA risks.
- Supporting multi-vendor delivery models, a key requirement for CalSAWS.

Benefits and Outcomes

By updating the auto-renewal logic to consider both administrative verifications (collected by counties) and e-verifications (received from CalHEERS), the renewal process now automates more eligible cases, reduces manual touches, and shortens cycle time-directly supporting county operations and member continuity of care. Table 2 provides a summary of the benefits resulting from this prior collaborative effort.

Table 2. Resulting Benefits and Outcomes from Team Infosys Collaborative QA Efforts

Operation Efficiency	
Higher auto-renewal rate	More cases meet automation criteria, shrinking the manual queue.
Faster recertifications	Fewer handoffs, earlier decisions.

Lower backlog & rework	Reduced pend/deny due to missing e-verification only
Compliance & Risk Mitigation	
Fewer benefit lapses	Automation reduces missed deadlines and continuity gaps
Reduced exposure to penalties	Timelier, policy-aligned renewals mitigate financial/legal risk from late processing.
Member Experience	
Seamless benefits maintenance	Eligible members keep coverage without unnecessary outreach.
Lower grievance/appeals volume:	Fewer avoidable denials tied to verification gaps
Workforce Optimization	
Staff time redeployed	Caseworkers focus on complex cases and customer service rather than low-value data validation.
Reduced overtime & burnout	Predictable workload and fewer spikes
Financial Impact	
Lower cost per renewal	Automation trims unit cost and mail/noticing spend
Avoided penalties	Timelines improvements minimize state penalty exposure
Data Quality & Auditability	
Stronger decision traceability	Clear linkage between admin/e-verification sources and eligibility outcomes.
Improved analytics	Better signals to forecast workloads and target outreach
Scalability & Future-Readiness	
Extensible rules engine	The approach generalizes to encompass additional data sources and new programs.
CalSAWS-aligned operations	Logic and test harnesses are portable to CalSAWS environments and multi-vendor delivery.
Governance & Reporting	
Transparent dashboards	Near-real-time visibility for leadership and counties.
Early-warning triggers	Thresholds flag rising backlog or cycle time slippage before SLAs are at risk

Example 2: Enhancing Temporary Homeless Assistance (THA) flexibility

In California, a homeless family eligible for or receiving CalWORKs may receive 16 nights of Temporary Homeless Assistance (THA) each year. Prior to Senate Bill (SB) 80, state regulations required these 16 nights to be used consecutively. With SB 80, California revised this rule to allow THA recipients to use the 16 nights non-consecutively, as needed.

However, the CalWIN system, which issues these benefits, was originally designed to allow only consecutive issuance. As a result, counties had to manually process non-consecutive payments, which:

- Prevented CalWIN from uploading subsequent THA issuance data to the state tracking system Medi-Cal Eligibility Data System (MEDS).
- Required manual financial tracking, increasing administrative burden.

Infosys collaborated with CalWIN to recommend and implement a critical system update:

- Enhanced coding logic to allow eligibility workers to issue 16 non-consecutive nights of THA.

- Automated benefit coding to classify payments as THA, eliminating the need for supervisor or financial manager approval and removing manual financial reconciliation.

Key Benefits and Impact

The suggested implementation significantly streamlined the issuance process for non-consecutive night benefits, delivering the following operational and compliance advantages:

- Process Automation & Efficiency Gains
- Eliminated the manual steps previously required, including:
 - Creating CalWIN Non-System Determined Issuance (NSDI)
 - Securing supervisor and financial management approvals
 - Manually updating the MEDS interface
- Resulted in faster, more consistent benefit processing

Regulatory Compliance Assurance

Ensured timely issuance of benefits, reducing the risk of counties falling out of compliance with state regulations.

Risk Mitigation

- Prevented double issuance of benefits, safeguarding program integrity
- Minimized errors associated with manual financial coding

Improved Financial Reporting Accuracy

- Reduced discrepancies in county spending reports caused by manual benefit entries
- Supported cleaner audit trails and better fiscal accountability

As noted above, the T-shaped profile staffing approach leveraged by Team Infosys, where we are continually cross-skilling our staff, has demonstrated positive results within the State of California.

1.1.2 Understanding and Approach 2

1.1.2.1 Understanding CalSAWS System Change Dynamics

Team Infosys has previously supported significant changes while working with the CalSAWS Consortium and other Health and Human Service (HHS) agencies. Our proposed team recognizes the complexity and scale of such transitions, having supported similar initiatives in other state eligibility systems like the District of Columbia Access System (DCAS) and the State of Connecticut Integrated Eligibility System. Our QA staffing approach is designed to be resilient, scalable, and responsive to these dynamic needs. This experience allows our team the insight to recognize the high probability for initiative modifications due to new technology and legislative mandates.

1.1.2.2 Approach

Preparation Activities for QA Excellence

Team Infosys adopts a strategic staffing model that emphasizes cross-skilling and continuous learning, ensuring our QA teams are not only equipped for current system needs but also prepared for future transitions such as those we anticipate for CalSAWS. Our learning activities encompass technology, domain and business aspects as noted below.

1. Cross-Skilling for Flexibility and Resilience

- QA professionals are cross-trained across CalWIN, CalHEERS, OCAT and CalSAWS-aligned platforms, enabling seamless collaboration across systems and reducing dependency on siloed expertise.
 - Staff are encouraged to gain proficiency in multiple functional domains — including eligibility, enrollment, benefits management, and data exchange — allowing them to pivot quickly as business needs evolve.
 - This approach ensures resource continuity, minimizes onboarding time, and supports multi-vendor delivery models critical to CalSAWS.

2. Ongoing Training in Emerging Technologies

- Infosys invests in structured learning programs focused on emerging technologies relevant to QA and HHS systems through the Infosys learning portal Lex:
 - AI/ML for test automation and predictive analytics
 - Cloud-native QA frameworks (e.g., Azure DevOps, AWS testing tools)
 - API testing and microservices validation
 - Low-code/no-code platforms for rapid test case development
- Training is delivered through a mix of internal academies, vendor certifications, and hands-on labs, ensuring QA staff stay current with evolving tech stacks.

3. Alignment with Evolving Business Functions

- Infosys QA teams are embedded within business process workflows, enabling them to understand and adapt to changes in policy, compliance, and service delivery models.
- As CalSAWS evolves to support integrated eligibility, real-time data exchange, and member-centric service models, our QA staff are trained to validate:
 - Interoperability across systems
 - Policy-driven eligibility rules
 - User experience and accessibility standards
- QA processes are designed to be extensible, allowing rapid adaptation to new programs (e.g., expanded Medi-Cal, SNAP modernization) and regulatory shifts.
- 4. Governance and Continuous Improvement
- Infosys maintains a QA Center of Excellence (CoE) that monitors skill gaps, tracks training progress, and ensures alignment with CalSAWS goals.
- Regular skill assessments and feedback loops help refine training paths and ensure QA staff are future ready.
- Knowledge repositories and reusable assets (e.g., test harnesses, automation scripts) are continuously updated to reflect system changes and business evolution.

As a result of our focus on the four noted domain and business aspects, our team is able to remain flexible to changes by leveraging the existing team members to assist in other areas, as needed during surge activities.

4. Maintain Strategic Bench for CalSAWS Future Readiness

A “strategic bench” is a pre-trained pool of cross-skilled resources, equipped with domain expertise across programs like Food Stamps, Cash Assistance, Medical Benefits, Refugee Assistance, and Foster care. These resources are process-ready and can be rapidly deployed to support CalSAWS initiatives, including future readiness efforts of urgent policy changes that require swift benefit delivery to citizens.

For example, in emergency situations like wildfires or floods, where citizens are in immediate need of assistance, the strategic bench enables rapid execution of requirements, design, and implementation often within a compressed timeline of one to two weeks.

This ensures:

- Zero disruption when new requirements, legislative mandates, or technology shifts occur.
- Continuity and resilience in ongoing QA and IV&V operations.
- Accelerated onboarding for new releases or modernization phases.

Core Focus Areas For Building The Strategic Bench

CalSAWS Domain Immersion Program

- Establish a Learning Academy focused on key modules such as Eligibility, Enrollment, Benefit Issuance, and Data Exchange.
- Conduct structured shadowing sessions with QA testers and release teams to expose bench members to real-time operational workflows and nuances.
- Maintain a centralized knowledge Repository that documents core program features and the latest policy updates for continuous reference and learning.

Continuous Technical Upskilling

- Provide training on emerging technologies driving CalSAWS modernization, including Microservices architecture, AWS cloud migration, integration strategies, and DevSecOps pipelines.
- Establish certification goals for bench members in area like:
 - Automation Frameworks: Selenium, Tosca or Consortium designated tools
 - Security & Compliance: OWASP, SOC 2, HIPAA readiness
 - Data & Analytics: Snowflake, predictive dashboards and reporting tools

Agile & Scaled Agile (SaFe) Enablement

- All bench members are trained and certified in Agile/Scrum or SAFe methodologies.
- Use mock Program Increment (PI) simulations to replicate the multi-vendor, multi-release cadence within CalSAWS.
- Foster cross-functional roles (QA, DevOps, Business Analysts) to enable seamless rotation when needed.

Table 3. Proactive Talent Pipeline & Succession Planning

Focus Area	Action Plan
Cross Skill Pollination	Encourage rotation between CalSAWS sub-projects – Such as Eligibility, Enrollment, Benefit Issuance, Notices, Imaging, Reporting and Self-Service Portal (BenefitsCal) to ensure broader exposure
Succession Planning	Identify backups for all critical roles, ensuring at least 2x coverage for each CalSAWS domain lead and automation architect to maintain continuity and reduce risk
On-Demand Pool	Maintain a bench readiness ratio of 15-20% to effectively manage surge capacity during new module rollouts or legislative change cycles.

Leveraging Knowledge Continuity & Retention Frameworks

- Deploy AI-powered knowledge bots to index project learnings, frequently asked questions (FAQs), and reusable scripts, enabling quick access and continuous learning.
- Implement a “Train-the-Trainer” model, where each Subject Matter Expert (SME) mentors 2-3 next-line leads to build scalable expertise and leadership continuity.
- Centralize reusable assets – Including test cases, regression packs, and API mocks-in a unified Knowledge Management Portal, ensuring seamless accessibility across the QA & IV&V ecosystem.

5. Involving AI for Document Reviews

Based on Infosys QA team's experience, CalSAWS typically operates multiple projects in parallel. A single QA resource may be assigned to 3–5 projects concurrently, each aligned to different functional areas and potentially mapped to same or separate release cycles. These projects often span overlapping timelines, requiring the resources to manage deliverables across multiple releases in succession. Manual reviews are time-consuming and increase the likelihood of overlooking critical details or missing required items.

In coordination with the Consortium, Team Infosys recommends exploring the use of AI and automation for document reviews as AI and automation can significantly accelerate document reviews for CalSAWS QA deliverable. Specialized tools leverage machine learning, natural language processing, and domain-trained models to analyze, cross-check, and summarize large volumes of documents, flag inconsistencies, and streamline workflows for reviewers.

How AI Speeds Up Document Reviews

Automated Content Analysis: Modern AI tools analyze document structure, content, and requirements, highlighting missing sections, inconsistencies, duplications, and non-compliance areas all in minutes rather than hours.

Contextual Summarization and Comparison: Advanced language models (like ChatGPT, Claude opus) quickly summarize lengthy QA documents, compare deliverables to templates or previous versions, and identify risk patterns, omissions, or obligations, supporting more efficient final review cycles.

Workflow Notification and Escalation: Sass tools (e.g. Veza) automate review reminders, escalation, and review cycle management, ensuring all documents are addressed on schedule, reducing administrative overhead.

Based on prior experience using AI for document reviews, Team Infosys can recommend several document review tool options as noted within Table 4 below.

Table 4. Potential AI Tools and Primary Features

Tool Name	Primary Feature / Benefits	Integration
Microsoft Copilot	General document review, built into office apps	Integrates with Microsoft eco system.
Google Workspace AI	AI-based content analysis, pattern recognition	Integrates with Google Workspace
Verifi AI	QA documentation, data extraction, compliance, enrichment	End-to-End QA documentation coverage
Veza	Automated workflow for document review cycles	Notification and escalation features
Gen AI based solutions	Document traceability, Release Management	Best for Software QA review

Key success factors for AI-Based QA Deliverable Review

- Use solutions with domain-specific training for QA and compliance deliverables to boost accuracy.
- Integrate chose AI tools with document management and workflow platforms for seamless notifications and artifact tracking.
- Ensure robust security and compliance; prioritize vendors with relevant certifications for sensitive QA documentation.

Deploying these AI-powered tools transforms each manual review into a fast, repeatable, and intelligent process helping CalSAWS QA teams handle large volumes of deliverables efficiently while maintaining document quality and compliance. AI powered document reviews can dramatically reduce manual effort and accelerate QA deliverable assessments, especially for high-volume environments like CalSAWS. Specialized tools use domain-trained models and advanced automation to highlight issues, compare documents, and manage review workflows in a fraction of the traditional time.

In summary, our proactive approach includes cross-skilling of existing team members, emerging technology training, clear alignment to business functions, maintaining a strategic bench, and adoption of AI as it emerges. These activities prepare our team for the future adjustments that are expected based on historical programmatic trends.

1.1.2.3 Prior Examples

Team Infosys and our deployed QA teams have consistently demonstrated the ability to adapt to significant system changes, legislative mandates, and technology transformations within large-scale eligibility systems such as CalWIN. Below are four examples that illustrate the success of our approach that has delivered QA flexibility and capability to the direct benefit of our customers.

Example 1: Migration of correspondence services from On-Premises to AWS

Infosys provided full support to successfully transition all correspondence generation and delivery processes from an on-premises infrastructure to a cloud-based AWS environment without disrupting ongoing operations as part of our prior CalWIN support.

During this migration, resource constraints required us to allocate one QA specialist exclusively for the migration effort while another managed release-specific activities. Our ability to overcome this challenge was possible due to the cross-skilled nature of our QA team, enabling seamless role flexibility. Additionally, our monthly internal knowledge-sharing sessions ensured team members had a comprehensive understanding of the overall CalWIN system across multiple programs, allowing us to maintain quality and timelines despite the increased workload.

Example 2: Parallel integration of OCAT with CalWIN and CalSAWS

To enhance the Welfare-to-Work (WTW) appraisal process, the Online CalWORKs Appraisal Tool (OCAT) was integrated with CalWIN and CalSAWS. OCAT is a cloud-based application designed to integrate with all consortium systems to streamline to the WTW appraisal process such as helping case managers determine assess the strengths and barriers of WTW, appropriate services and activities to guide participants toward self-sufficiency, employment and education history, health, and family concerns to create a personalized work readiness plan. To enable this integration, Infosys and the M&O vendor collaborated closely with the third-party vendor and CalSAWS to align on approach, timelines, field mappings, and data transfer requirements for successfully moving appraisal-related information from CalWIN to OCAT.

Infosys developed comprehensive regression and end-to-end test scenarios to ensure that existing functionalities remained intact and that the integration worked seamlessly. This included validating that all required field updates were accurately pushed to OCAT and that acknowledgments and completed Appraisal Summary Reports (ASRs) were successfully received.

Although providing on-call support during UAT was not part of Infosys' original scope, we extended our support to monitor issues raised during UAT, responded promptly, and engaged technical teams when necessary to distinguish between actual defects and user understanding issues.

County Benefits:

- Reduced duplicate data entry and improved data quality
- Access to Appraisal Summary Reports (ASRs) within CalWIN
- Seamless client movement between counties
- Increased access within the counties
- Centralized user login and access management
- Enhanced user navigation, usability, and accessibility

Example 3: CalWIN Migration from CA Service Desk to ServiceNow

Challenge: The long-standing incident management process was planned for migration from CA Service Desk to ServiceNow. To ensure a smooth transition, Infosys carefully analyzed all existing ticket flows in CA Service Desk and identified mandatory fields required within ServiceNow. Missing any of these fields could cause significant issues during SLA analysis.

Our Approach:

- Conducted a detailed field mapping exercise to align CA Service Desk fields with ServiceNow equivalents.
- Collaborated with stakeholders to validate mappings and ensure no critical data elements were overlooked.
- Oversaw the migration of the entire production ticketing and incident management process while maintaining historical data integrity and SLA compliance.

Outcome:

- Achieved 100% data accuracy during migration.
- Improved ticket resolution tracking and enhanced reporting capabilities for production support.

Example 4: Mitigating COVID-19 Public Health Emergency (PHE) Impact on Medi-Cal

During the COVID-19 PHE, Medi-Cal renewals were paused, resulting in cases with past-due renewal dates that needed to be updated prior to the PHE lift or system migration. Under the executive order, no discontinuances or negative actions were permitted. However, during the PHE unwinding period, the Department of Health Care Services (DHCS) extended a delay on actions such as:

- Transitioning from full-scope to restricted-scope aid codes
- Changes or increases in Share of Cost (SOC)
- Discontinuances due to annual renewals or reported changes in circumstances

This delay ensured continuous coverage for beneficiaries during the transition.

To support counties in resuming normal case processing post-PHE, DHCS directed CalWIN to prevent any batch-authorized negative actions until the renewal process was completed. Infosys collaborated with CalWIN to propose targeted SQL scripts that:

- Identify cases with past-due renewals
- Detect individuals under Young Adult Expansion (YAE)
- Extend renewal dates to avoid discontinuances and allow uninterrupted coverage

These SQLs also enabled counties to generate case lists for manual processing when needed. Counties could apply special indicators to guide SQL behavior — such as extending renewal dates, maintaining current benefit coverage, and suppressing negative batch actions.

The automated approach significantly reduced backlog and helped counties transition smoothly into normal processing post-PHE. Additionally, as counties migrated to CalSAWS, Medi-Cal renewal dates were extended to future dates, further minimizing manual effort and backlog.

In summary the staffing approach used by Team Infosys has a proven track record of supporting the types of challenges encountered by the Consortium and their support staff.

1.2 Sub-Section 5.2.3.2 – Integrated Multi-Contractor Environment

1.2.1 Understanding and Approach 3

1.2.1.1 *Understanding the QA Services Scope*

Team Infosys has a shared understanding of the Consortium's vision and objectives for QA Services, which emphasizes a collaborative engagement, seamless integration within a multi-contractor ecosystem, and a strong focus on driving innovation and continuous improvement within established processes. Our systematic approach is outlined to not only meet but exceed the expectations outlined in the RFP, through a combination of proven methodologies, modern QA practices, and deep domain expertise in HHS systems.

As demonstrated by our prior CalWIN support, Team Infosys successfully integrates into the customer's designated ecosystem, working closely with other contractors and agencies responsible for development, operations, and support; along with County stakeholders across diverse regions with varying operational needs and the State agencies and policy teams to ensure alignment with regulatory and eligibility requirements.

Through our prior experience supporting CalWIN and the CalSAWS Consortium, Team Infosys clearly understands the multi-vendor environment in which the CalSAWS Consortium system operates, including the operation of the BenefitsCal System involving different contractor teams working collaboratively on all aspects of the CalSAWS System. The operational landscape of the current multi-vendor environment includes the Gainwell Technologies Project team providing Infrastructure services; and the Deloitte team delivering M&O and BenefitsCal services. In their role of governance, the Consortium monitors the work of all contractors and acts as the liaison between stakeholders such as the State and Federal program sponsors, JPA Board of Directors, Project Steering Committee, Counties, interface partners and Stakeholders.

Team Infosys fully recognizes the QA team's critical role in delivering Quality Assurance services across all systems and Maintenance & Operations (M&O) business processes, including CalSAWS and BenefitsCal. Most importantly, our QA team is committed to operating effectively within the multi-contractor CalSAWS environment, supporting the broader CalSAWS ecosystem.

Infosys understands the QA team's central role and the need to coordinate with the Consortium and other CalSAWS contractors to ensure understanding and collaborative agreement of the roles and responsibilities of the Consortium and each contractor. Based upon Quality Assurance Roles and Responsibilities requirements, Infosys understands our scope of work spans across activities like Project Management, Change Control Board Process, Defect Management, Applications (CalSAWS and BenefitsCal) Analysis, Performance Measurement Monitoring and Reporting, Procurement of Hardware and Software, Operations Management, Batch Support, Configuration, Architecture, and Network & Security Management tasks.

1.2.1.2 Approach

To ensure our QA team is properly managing our scope of work, the Team Infosys approach starts with a review of existing documentation. In performing this review, we leverage our CMMI Level 5 organizational capabilities to ensure a structured and methodical review of our scope, which is integral to our overall Project Management (PM) Framework. Our framework and methodology emphasizes detailed planning, transparent communication, rigorous documentation, and collaborative execution. These four elements ensure successful delivery in a multi-stakeholder environment. As such, our review and assessment of the programmatic and contractual documentation as well as the designated QA support activities and documentation is performed to ensure alignment. This approach also ensures our scope of work and activities performed are fully aligned with the Consortium's QA service expectations. As a course of our review, if our team identifies any potential ambiguities, we work as a collaborative teammate to remove the ambiguity and advance the collective services delivered to the Consortium and the CalSAWS Project.

Further, we fully recognize that effective scope management extends beyond internal responsibilities and requires alignment with the Consortium and all participating vendors. To that end, our approach ensures clarity, accountability, and shared understanding across all entities involved.

During the initial transition phase, Infosys intends to refresh and ensure our comprehensive understanding of the CalSAWS environment through an accelerated, phased approach to ensure a smooth and seamless transition. Ultimately, Infosys aims to support the Consortium's strategic visions by conducting in-depth analysis and offering realistic, actionable recommendations for enhancements in all areas of the CalSAWS Project.

1.2.1.2.1 Key Scope Management Activities

To ensure our staff remains fully aligned to our scope and provides the required timely services, we employ the following:

- **Initial Scope Review.** Infosys begins by thoroughly reviewing existing documentation, including the Project Control Document (PCD), the Quality Assurance Services Plan and other relevant deliverables during the transition and onboarding period. This enables us to gain a comprehensive understanding of current workflows processes, and activities, and to clarify the scope in alignment with the Consortium's objectives and contractual expectations.
- **Scope Documentation and Governance:** Based on the initial review, we further clarify scope areas and associated activities to establish a baseline Quality Assurance Work Plan Schedule for monitoring progress, managing changes, and ensuring accountability. Project management tools are utilized to track tasks, dependencies, and timelines effectively. A comprehensive scope document is maintained, detailing requirements, dependencies, and assumptions. Also existing Operational Level Agreements (OLAs) and Service Level Agreements (SLAs) could be defined to ensure accountability and compliance.
- **Maintenance of the Quality Assurance Services Plan & Project Control Documentation (PCD):** On a recurring basis, **Team** Infosys reviews and maintains the comprehensive Quality Assurance Services Plan, Project Control Documents (PCDs) and all other documents that clearly define scope and procedures. Building upon the initial review of existing PCDs including the Scope Management Plan, Team Infosys creates and delivers Operational Working Documents (OWDs) with operational activity details to support the Enterprise PCD framework.

These OWDs capture the detailed activities for the scope analysis and are aligned with key project governance and management plans, including but not limited to:

- Governance Management Plan
- Communication Management Plan
- Contract Management Plan
- Scope Management Plan

This structured documentation review and update approach ensures consistency, traceability, and alignment with Consortium objectives, while enabling effective monitoring, change management, and stakeholder engagement throughout the project lifecycle.

The Infosys periodic reviews of the PCD and relevant scope documentation also serve to identify and document any changes in roles, responsibilities, procedures, or activities that fall within the QA vendor's scope. This ensures that scope remains current and reflective of evolving project needs.

- **Stakeholder Engagement and Approval:** Proposed changes to scope or procedures are discussed with the Consortium, related vendors, and dependent stakeholders to ensure consensus as well obtain formal approval and sign-off. This process ensures mutual agreement and provides a clear reference for future execution.
- **Documentation and Governance:** A comprehensive scope document is maintained, detailing requirements, dependencies, and assumptions. Also existing Operational Level Agreements (OLAs) and Service Level Agreements (SLAs) could be defined to ensure accountability and compliance.

1.2.1.2.2 Key Coordination Activities with Consortium and Others

To ensure mutual understanding and a collaborative agreement on roles and responsibilities, our QA team:

- Reviews existing PCDs and QA documents to gain clear understanding on established communication processes between vendors, Consortium and other partners.
- Conducts an initial joint kickoff and alignment meeting with the Consortium and other CalSAWS contractors. During this meeting, we review and clarify scope boundaries and interdependencies as well as ensure all the scope and procedures are documented accurately in the PCD documentation required to assume responsibility for all CalSAWS Quality Assurance (QA) services.
- Our QA team regularly reviews and updates the QA Transition-In activities outlined in the Quality Assurance Work Schedule, in alignment with the Quality Assurance Services Plan. Once the transition period concludes and the QA team assumes primary ownership of the QA activities, they continue executing tasks as per the plan and provide consistent status updates through the QA Report submitted to CalSAWS.
- Dependency Mapping: Team Infosys identifies interdependencies on and between vendors and project components, ensuring seamless integration and coordination. Handoff on Incidents and Requests are documented via different HelpDesk ticketing systems like ServiceNow and JIRA to track approvals and expectations on timelines to resolve the requests and issues.
- RACI matrix - QA Team continues to review and maintain the Responsibility Assignment Matrix (e.g., RACI) to detail the existing coordination mechanism used by the Consortium and other vendors to delineate roles across all stakeholders in all relevant PCD documentation.
- QA Services OWDs - Our team reviews and maintains QA Services Operational Working Documents (OWDs) (as defined in the RFP deliverables) that provide detailed

procedures for the activities and processes contained in the Quality Assurance Services Plan.

- Infosys initiates discussions with all stakeholders, including clients, internal teams, and vendors, to understand expectations, requirements, and constraints. This engagement is critical in multi-vendor environments where dependencies and overlapping responsibilities exist.
- Collaboration with clients and multiple vendors during the operation: Collaboration during the operation is essential for aligning client objectives with vendor capabilities. Infosys maintains and employs a multi-vendor governance framework to ensure effective communication, coordination, and risk management.
- Infosys also initiates collaboration meetings with PMO, Business, Infrastructure, and representatives from all other vendor teams at a regular cadence i.e. weekly/biweekly to sync up and call out any dependencies, issues or risks.
- Leverage coordination meeting forums - Our QA Team participates and leverages existing coordination meeting forums (e.g., standing management and workgroup meetings, the Joint Powers Authority Board of Directors, Project Steering Committee, Technical Change Advisory Board, SCR change control meetings, enhancements and Collaboration Model meetings, Critical Incident Management meetings, Central Print and Imaging meetings, and performance meeting) to address overlaps, dependencies, and risks proactively.
- For effective communication and issue resolution, our team ensures clear and timely communication through:
 - Clear escalation paths for resolving scope-related conflicts or ambiguities.
 - Use of CalSAWS defined collaborative tools (e.g., MS Teams, SharePoint, JIRA, ServiceNow tickets) to facilitate real-time updates and feedback.
- By fostering a collaborative environment, we ensure that all parties are aligned, informed, and empowered to deliver successfully within their defined scope.
- As part of our support for QA activities, we proactively identify opportunities to enhance existing communication and coordination processes. This includes highlighting key insights, risks, and issues, as well as analyzing observed trends supported by relevant data points. These findings are communicated to the Consortium through established deliverables such as QA-D03 (Quality Assurance Monthly Status Report) and QA-D05 (Quality Assurance Monthly Test Report), which are published at the agreed cadence.

As the QA vendor, Team Infosys uses the following Project Management principles which address the scope management and multi-vendor coordination activities. Infosys, leverages project management best practices along with PMO team to:

- Provide Account Governance
- Resolve issues that arise out of dependencies of responsibilities between vendors
- Supervise and oversee the performance of the account from a multi-vendor perspective
- Conduct detailed operations reviews that include key projects being worked across multiple vendors
- Maintain a strong governance structure that extends multiple levels of touch points for vendors to enable efficient end-to-end service delivery
- Align strategies with vendors using joint approach planning sessions to align with overall Business and IT strategy
- Align roles and responsibilities by clearly defining protocols for all the touch points between vendors
- Align architectural strategies and technical solutions using joint architectural forums

- Review the governance structure that is aimed at integrating with CalSAWS and its vendors.
- Regularly report on delivery of services against service level agreements
- Scope management – Status of the scope items, potential risks and issues and interventions required to address them, slippages and remedial plans
- Risk and Issue management – Proactive risks and issues identification and communication, mitigation plans – Status of implementation
- Process improvements – Identifying areas for process improvements, Process improvement plans and implementation timelines, implementation status reports across various project areas, reporting the benefits of process improvements in terms of effort or cost.
- Governance and communication – Leveraging PMO to facilitate quick decision and free flow of communication and feedback, Key roles and responsibilities, Issues resolution and Escalation Mechanism, change management process through change control board, Managing scope changes, etc.

Team Infosys is adept at working within the multi-vendor support environments. A few of the typical challenges and potential mitigations are listed in Table 5 below based on our previous experience.

Table 5. Typical Challenges and Mitigations in Multi-vendor Collaboration Projects

Challenges	How Infosys addressed them
Multiple team ownership leading to delays and SLA misses Lack of end-to-end view of the services landscape – systems, processes and operations Lack of integration in processes Multiple service management tools resulting in increased redundancy, cost and complexity Absence of proactive and cost-effective management of end-to-end IT risks	• Challenges faced by organizations in realizing the real benefits of a multisource ecosystem was resolved by implementing the Infosys Service Integration and Management (SIAM) framework that enabled global, harmonized processes and toolsets, integrating the delivery of IT services to business in a seamless and transparent manner.
Differences in processes and approaches of each vendor.	• Team Infosys and other vendors perform joint strategy planning sessions along with the Client to come up with a cohesive approach • That helps the Client meet its business objectives. The Infosys or Vendor process best suited for the Client is adopted and integrated with the existing quality systems. • Clearly defined Standards and Processes. Define protocols for touch points – templates for deliverables, acceptance criteria, etc.
Service Management	• Infosys and vendors align service management processes so that Client gets the best of breed service from both the vendors
Reporting and Communication challenges	• Team Infosys facilitates discussions between the team leads from each vendor along with the Consortium to meet, discuss, and make decisions. • Share weekly status reports (in agreed upon format) with each vendor a day before the weekly status meeting.

	Maintenance of cordial relationships and regular communications with engagement leaders from other vendors.
Handling exceptions	Exception handling mechanism is defined during the start of the engagement. All exceptions are communicated to PMO, Client Senior Management, Vendor Leads.
Competition amongst vendors for incremental engagements in the portfolio	- Defined & documented escalation procedures. - Ensure that portfolio leadership is fully aligned with the governance framework. - Health check: Periodic weekly reviews with the portfolio leadership for health assessment of progress metrics, challenges & accomplishments.
Logistics: Teams fragmented across locations	Ensuring resource availability across time zones for business continuity; through the Infosys 'Global Delivery Model'.
Role / Responsibility / Accountability	Framework that is agreed between all parties for effective functioning. Ensure scope clarity for each vendor. Defining and reporting operational service level procedures between the vendors. Client involvement in establishing the target scope and responsibilities for each vendor and overall vendor management.

1.2.1.3 Prior Examples

Team Infosys provides two different HHS-type customer support functions where our team operated successfully within a multi-vendor environment to successfully provide QA services.

Example 1: Engagement with the CalWIN Welfare Client Data System (WCDS)

In our previous engagement with the CalWIN WCDS Consortium, Infosys was entrusted with a comprehensive scope of responsibilities, including Project Management (PM), Independent Technical Consulting (ITC), and Quality Assurance/Quality Control (QA/QC). Our team was responsible for overseeing and validating various system components, deliverables, work products, and Maintenance & Operations (M&O) services. We closely monitored the M&O vendor's performance and compliance, ensuring alignment with contractual obligations and service-level expectations.

Infosys developed a deep understanding of the multi-vendor framework, which included coordination with external agencies, County Subject Matter Experts (SMEs), and stakeholders across different programs and modules. Given that CalWIN served 18 counties, effective communication and collaboration was critical. Our team ensured consistent representation of all counties, product owners, Program SMEs, and vendor activities, facilitating seamless implementation of changes and ensuring stakeholder satisfaction.

To mitigate risks and prevent late-stage issues, Infosys emphasized early stakeholder engagement, gathering feedback from the requirements phase onward. This proactive approach helped identify potential gaps early and ensured smoother project execution.

Operational and Infrastructure Support

For operational efficiency and smooth communication, our team documented primary and secondary points of contact from county infrastructure teams, including escalation managers and regional managers. This documentation was regularly reviewed and updated to reflect staffing changes, ensuring accurate and timely communication.

We also enhanced the communication process by refining templates for clarity and consistency. Standardized distribution lists were implemented and periodically reviewed to

maintain effective collaboration across all teams. These improvements contributed to streamlined communication and better coordination among stakeholders.

Process Improvements and Reporting

Infosys consistently shared key observations and trend analysis, recommending process improvements to enhance overall project delivery. The scope of work and procedures were defined in the Project Control Document (PCD), which was reviewed annually to incorporate updates based on evolving processes and best practices.

In alignment with CalSAWS requirements, our QA team documented scope, activities, and procedures in QA Management Plan deliverables. All QA activities were executed in accordance with the PCD-defined processes and schedules. We also published a comprehensive Monthly QA Status Report, detailing ongoing activities, identified anomalies, trends, risks, and actionable insights for WCDS management.

Example 2: Engagement with State of Connecticut – Health and Human Services (HHS)

Infosys brings extensive experience in managing multi-vendor environments, as demonstrated in our engagement with the State of Connecticut's HHS program. This initiative required coordination across vendors responsible for Design, Development Implementation & Maintenance, Incident Management, Infrastructure Maintenance, Application Hosting, Batch Processing, Plan Management, and EDI components within the Health Insurance Exchange (HIX).

To manage this complex landscape, Infosys utilized JIRA, Helix and other team specific Helpdesk ticketing tools for documenting requests, tracking inter- and intra-team dependencies, and ensuring timely resolution. The tool also facilitated escalation of delayed requests based on severity and priority, promoting accountability and transparency across vendors.

Infosys applied industry-leading project management practices to define scope, align stakeholders, and mitigate risks. Our structured methodology and robust engagement model, supported by proven frameworks and tools, enabled us to effectively address the challenges of multi-party collaboration.

In a related engagement, Infosys developed the Enterprise Operating Model (EOM) Scope of Services document for the State of Connecticut's HHS program. This document captured all vendor activities across various tracks and programs, including support for the AccessHealth HIX and EOM ImpaCT teams. Each team focused on distinct applications and processes that supported the operational and delivery needs of the Department of Social Services and Access Health CT, ensuring comprehensive service coverage.

1.2.2 Understanding and Approach 4

1.2.2.1 Understanding

We understand the CalSAWS requirement to identify and track issues with high risk and urgency to closure mainly across management requirements, production readiness and security areas which are grouped into Operations and Independent validation of requirements. Below is our approach to detect high risk areas and/or high urgency areas to identify candidates for subsequent deeper QA analysis/risk assessment.

1. Identifying High-Risk and High-Urgency Areas

Infosys begins with a risk-based QA planning approach, leveraging both qualitative and quantitative inputs. We use the following techniques to identify high-risk areas:

- **Historical Defect Analysis:** Reviewing past defect trends across modules to pinpoint areas with frequent or critical issues.
- **Impact Assessment:** Evaluating business-critical functionalities, user-facing components, and integration points that have a high impact on operations or compliance.
- **Stakeholder Inputs:** Collaborating with business and technical teams to gather insights on perceived risk areas and recent changes.
- **Tool-Based Risk Profiling:** Using tools like SonarQube, JIRA analytics, and test coverage reports to highlight modules with low coverage, high complexity, or frequent changes.

This multi-dimensional analysis helps Infosys prioritize areas for deeper QA focus.

2. Conducting Deeper QA Analysis

Once high-risk areas are identified, Infosys performs targeted QA activities such as:

- **Focused Test Design:** Creating detailed test scenarios that cover edge cases, boundary conditions, and integration paths.
- **Exploratory Testing:** Applying session-based exploratory testing to uncover hidden defects in complex workflows.
- **Static Code Analysis & Peer Reviews:** Enhancing code quality checks to catch issues early in the lifecycle.
- **Regression Impact Analysis:** Using automation tools to assess the ripple effect of changes across dependent modules.

These techniques ensure thorough validation of critical areas and reduce the likelihood of post-production defects.

3. Deploying Risk Mitigation Strategies

Infosys implements a proactive risk mitigation plan that includes:

- **Early Defect Detection:** Integrating QA early in the SDLC through shift-left practices and CI/CD pipelines.
- **Automated Monitoring:** Setting up automated smoke and sanity tests to catch failures immediately after deployment.
- **Risk-Based Test Prioritization:** Allocating QA effort based on risk severity and business impact.
- **Continuous Feedback Loops:** Using dashboards and QA reports to provide real-time visibility to stakeholders and enable quick decision-making.

This structured approach ensures that risks are not only identified but actively managed throughout the QA lifecycle.

Per the standard Project Management procedures, Team Infosys identifies, tracks, and provides timely updates on dispositions and updates towards closure of High-Risk areas in the Risk tracker and brings it to attention of the Consortium via Quality Assurance Monthly Status Report in accordance with the process identified in Enterprise PCD and Quality Assurance Service Plan, OWDs, and process documentation.

1.2.2.2 Approach

Team Infosys leverages the noted key tools and techniques for Identifying High-Risk and High-Urgency candidates for deeper QA analysis.

1. Automated Testing Tools:

- Automated tools such as open-source Selenium framework, Appium or existing Automation tools being used in the CalSAWS ecosystem can be utilized for regression testing and functional validation of applications supporting food, cash, and/or medical assistance social programs covering identified critical program scenarios. These below

sample tools enable rapid identification of discrepancies and areas requiring deeper analysis.

- Selenium / Cypress: For UI and functional testing of web apps.
- Appium: Mobile app testing.
- Playwright: End-to-end test automation with fast coverage and CI/CD integration.
- To identify candidates for deeper QA analysis in AWS-related applications, our team can leverage a combination of tools, techniques, and best practices that align with cloud-native architectures and DevOps workflows.
- Tools for Monitoring & Observability
- AWS CloudWatch: Monitor logs, metrics, and application health.
- Datadog, New Relic, or Dynatrace: Advanced observability and APM tools.
- Tools for Anomaly Detection
- Leverage CloudWatch Insights or AWS X-Ray to detect unusual patterns or errors.
- Flag services with frequent or severe anomalies for deeper testing.

2. Risk Scoring Models:

- Risk scoring models are implemented to quantify risk levels across program components. Factors such as frequency of issues, severity of impact, and likelihood of occurrence are used to assign scores, helping prioritize areas for deeper QA analysis.

3. Root Cause Analysis (RCA):

- Systematic RCA techniques, including the 5 Whys and Fishbone Diagrams, are employed to investigate high-risk areas. These methods help identify underlying causes of defects or failures, enabling targeted interventions. These also include, RCA done when a trend or a high volume of tickets are observed from a particular area, program or scenarios.

4. Continuous Monitoring and Analytics:

- Dashboards tracking of key performance indicators (KPIs) related to program performance are used for continuous monitoring. These dashboards provide real-time insights into shifts in risk status, allowing dynamic adjustments to QA focus.

5. Prioritization of High-Risk Areas and Urgency - Risk Matrix:

- A risk matrix categorizes identified risks based on their likelihood and impact. This visual tool aids in prioritizing areas requiring immediate attention versus those suitable for long-term monitoring.

6. Service Level Agreements (SLAs):

- QA efforts are aligned with SLAs established for resolving high priority and severity key issues related to impacted SNAP, TANF, and HIX programs. Processes at risk of breaching SLAs are flagged for immediate intervention to ensure compliance and service delivery timelines. Team Infosys also provides recommendations for the tickets for correction with correction priority and severity based on defined criteria, so that high impact issues are resolved earlier.

7. Feedback Loops:

- Feedback loops with end-users and stakeholders like CalSAWS product owners are established to remain responsive to emerging issues. Regular reviews of program performance and user satisfaction surveys help identify new high-risk areas.

8. Employee Training and Awareness:

- As noted previously, Team Infosys ensures our staff involved in QA processes are equipped with the necessary skills and awareness through structured training programs. For example, the Infosys Lex platform provides continuous learning opportunities,

enhancing employees' ability to detect and address risks effectively. Domain training ensures our staff remain up to date on HHS changes.

9. Structured Risk Assessment Framework:

- A proactive risk assessment framework is employed to identify and evaluate risks specific to SNAP, TANF, and HIX programs etc. or technical failures causing outages. This framework integrates industry best practices, regulatory compliance requirements, and program-specific risk factors such as data integrity, accessibility, and service delivery timelines.
- Risk assessments are conducted periodically or at the initiation of new processes, activities, or services. Identified controls are implemented and revalidated to ensure effectiveness.

10. Data-Driven Analysis:

- Historical data, including audit results, incident reports, and user feedback, is analyzed to identify patterns indicative of high-risk areas. For example, regions with frequent application errors or delays in benefit disbursement are flagged for further investigation.
- Demographic data is also leveraged to identify populations disproportionately affected by service delivery issues, ensuring equitable program access.

11. Stakeholder Engagement:

- Regular workshops and feedback sessions with stakeholders, including eligibility workers, product owners and program administrators, provide qualitative insights into operational challenges. This engagement complements data analysis by uncovering high-urgency areas that may not be immediately evident. Based on prior experience, program wise SME meetings with program administrators and SMEs are organized with regular cadence to get feedback on the issues which need to be addressed urgently due to severe disruption to the beneficiaries or impeding work for the eligibility workers.

12. Defect clustering and trend analysis to detect recurring issues.

13. Change impact mapping to assess the ripple effects of policy or system updates.

14. Dependency tracking across integrated systems (e.g., CalSAWS, CalHEERS, External Agency Interfaces) to highlight areas prone to miscommunication or delays.

Infosys executes the following Issue and Risk Management process activities to proactively identify, assess, mitigate, and monitor potential challenges throughout the project lifecycle.

These activities are designed to ensure timely resolution of issues, minimize project risks, and maintain alignment with stakeholder expectations and contractual obligations. Our structured approach enables effective governance, promotes transparency, and supports informed decision-making across all phases of delivery. By integrating a structured risk assessment framework, advanced tools and techniques, and a robust prioritization approach, Infosys ensures a comprehensive QA process for detecting and addressing high-risk and high-urgency areas within public benefits and insurance affordability programs and supporting technical operations. This approach aligns with the CalSAWS objectives of improving program efficiency, compliance, and service delivery quality.

1.2.2.3 Risk Management

Risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives. Risks can arise from uncertainty in business objectives, portfolio, program and project management, and threats from project failures at any phase in analysis, design, development, integration, testing, UAT, production, or sustainment life cycles.

Risk Management is the planning, identification, assessment, analysis and prioritization of risks to provide the level, type and visibility of risk management appropriate for the Consortium. Team Infosys risk management approach provides appropriate risk handling and monitoring actions that mitigate risks and outlines the steps to manage risks. Each risk is assigned to a risk owner who is responsible for re-assessment of risk, risk handling planning, execution and closure. Effective risk handling strategies include:

- Selecting a lower-risk alternative
- Building in schedule slack to permit flexibility
- Starting a critical activity earlier than normal
- Creating a risk mitigation plan
- Allocating more resources
- Closely monitoring the risk to decide when to take risk handling actions

A robust risk management process at the operational level is a key requirement for reducing uncertainty. Team Infosys identifies any condition whose occurrence is uncertain, and which would result in an unfavorable outcome as a risk. The risk assessment and control processes at Team Infosys helps to identify the various risks, their Impact, probability of occurrence and corresponding mitigation plan. These details are captured in a detailed Risk Management Plan and are tracked throughout the project lifecycle. The Risk Management Plan is continually modified to reflect the changing realities and circumstances of the project. The risks that have been identified with high probability and high impact are reviewed in the regular status meeting and mitigation plans are modified to meet them.

In addition to the above, the Team Infosys program team also receives input from a dedicated unit within the Team Infosys Delivery Risk Management (DRM) unit, and an independent Audit team focused on Software Quality Processes. These two teams are within Team Infosys internal organization and support ongoing key programs. The Team Infosys QA Team receives input and support on continuous basis from these two internal team on risk management through the lifecycle of the project.

Team Infosys works with the Counties to identify, assess, prioritize, monitor and report to the Consortium those assessments and any recommendations for mitigation. Team Infosys analyzes, determines scope and evaluates each identified issue/problem to ascertain risk levels relative to the schedule, staffing and stakeholders, technical feasibility, functional viability, and cost.

Team Infosys takes a well-defined, structured and iterative approach for Risk Planning, Identification, Analysis, Evaluation, Assessment, Prioritization, Documentation, Tracking, Controlling, Communication, Escalation, Resolution, Closure and Lesson Learned to proactively help all the stakeholders for resolving issues in a timely and efficient manner. Team Infosys works to facilitate the risk closure to ensure there is no or minimal impact on CalSAWS day-to-day operations.

The following sections provide the Team Infosys approach to Risk Management as depicted in Figure 1.



Figure 1. Team Infosys Risk Management Process

1.2.2.3.1 QA Approach to Risk Management

Team Infosys refers to the M&O Vendor Project Control Document and Risk Management Plan to understand the M&O Vendor's overall methodology and approach towards Risk Management Plan and Process. Team Infosys collaboratively works with Consortium and M&O vendor to discuss and implement improvements in the Risk Management Process.

After this detailed review of the M&O Vendor Risk Management Plan and Process, Team Infosys develops the QA approach and methodology to Risk Management. This QA approach and methodology to Risk Management are added in the QA Management Plan. This approach includes strategy for risk identification, analysis, assessment, documentation, prioritization, evaluation, owner assignment, roles/responsibilities of various stakeholders relating to risk management, risk categorization (portfolio, program and project), risk tracking, risk control, communication, monitoring mitigation steps, develop of risk response action plan step, reviewing mitigation steps, updating risks status, risk escalation process, develop / trigger / monitor contingency plans, reviewing risk closure, reporting risk status and recommending improvements.

This QA Risk Management is monitored and evaluated at regular intervals and updated on quarterly basis.

1.2.2.3.2 Risk Identification and Documentation

Issue Identification involves identifying risks that can avert, degrade or delay the achievement of CalSAWS objectives at various levels such as project, program or portfolio. Team Infosys gives utmost importance to identifying the risks as early as possible to reduce the rework at later stages. Team Infosys proactively raises the awareness of the risk areas and protects the interests of the Consortium.

1.2.2.3.2.1 Review CalSAWS M&O Effort

Team Infosys is vigilant in observing any potential risks in the CalSAWS day-to-day activities and operations. Team Infosys reviews the CalSAWS M&O vendor's efforts and any other circumstances to identify any significant deficiencies or risks that could significantly impact the

Migration Project or the System including the budget and schedule. After this review, we gather and document the detailed lessons learned and perform root cause analysis and report the risk details and recommended improvements (if any) to the Executive Director. As warranted, we secure the necessary approvals for the recommended improvements roll out and implementation.

1.2.2.3.2.2 Identifications and Documentation

Team Infosys follows the risk identification methods below, such as:

Checklists:

Checklists are simple lists of risks found to occur regularly in software development projects. Team Infosys goes through checklists deciding which risks apply to the CalSAWS Project. By using checklists Team Infosys identifies the areas of uncertainty and finds countermeasures to cope with them.

Brainstorming

Team Infosys discusses and identifies the different parts of the project to clarify the risks that might occur. Brainstorming is used to identify possible solutions to any problems that emerge.

- Examine project WBS to uncover risks
- Review lessons learned from similar projects
- Review project assumptions and uncertainties
- Solicit risks in the early phases of the project and in subsequent phases
- Review problem reports, QA/QC analysis, and project metrics
- Review project history
- Interview SMEs and Consortium team and M&O Vendor Project Managers and staff

Once the Risk is identified by Team Infosys or any other Stakeholders in the existing Project Issues Management tool, Team Infosys ensures that the appropriate risk owner is assigned and the following fields pertaining to risk are included (but not limited to):

- Detailed Description
- Priority
- Staff responsibility assignments
- Dependencies and plans for mitigation
- Risk Response
- Fiscal, Schedule and any other Impact Assessment
- Mitigation and Contingency Plan (s)
- Risk Response Action Plan
- Targeted and actual resolution dates
- Risk Status

Team Infosys always places emphasis on documenting the risk details to the lowermost level as this documentation is a very important aspect in the Risk Management process. This documentation ensures proper details are recorded for reference purposes. Team Infosys ensures that all risks are getting logged in the appropriate risk management tool for broader visibility and awareness. Team Infosys captures all the mandatory fields while documenting a risk and also reviews to ensure all the existing risks include the following fields. Related to the risk documentation review (but not limited to):

- Risk Name
- Risk Owner
- Risk Priority
- Risk Escalation Level
- (Risk Resolution) Due Date
- Risk unique identification number
- Dependencies and plans for resolution
- Staff responsibility assignments

- Risk Impact Level
- Probability
- Priority
- Date (Risk) Identified
- Date (Risk) Realized
- Consortium Project Staff ability to prioritize all Risks
- Schedule impacts if appropriate
- Resource impacts if appropriate
- Cost impacts if appropriate
- Targeted and actual resolution dates
- Resolution action

Additionally, Team Infosys places a strong emphasis on the risk name being properly captured for effective understanding by the stakeholders. In this regard, Team Infosys follows some of the best risk naming conventions such as:

- Risk Name should have an [Negative result] due to [Cause]
- The Risk Name should answer two questions:
 - What is the (future) negative result?
 - What is the source or reason of the risk?
- Sample Risk Names:
 - Poor quality due to high number of UAT defects
 - Delayed implementation due to issues in server upgrade

1.2.2.3.3 Risk Analysis and Evaluation

1.2.2.3.3.1 Risk Types and Scope

Team Infosys categorizes the risks by their Risk Type which also identifies their escalation level and is used to analyze and communicate them to the Consortium and M&O management for timely resolution. We use industry best practices to analyze, assess, scope and evaluate each potential risk timely and in an efficient manner to determine the severity and probability to the schedule, staff and stakeholders, technical feasibility, functional viability and cost.

- Project – Project Level Risks are existing within a specific project and impact only the given project.
- Program – A Risk is stated as program level when the Risk impact and Priority is high and its impact is beyond the project.
- Risks can be escalated to the Program level, but should only be escalated to the Program level when:
 - The project risk cannot be resolved by the project management team.
 - The project risk would be managed more effectively at the program level because it affects more than one project or requires a higher level of authority to be resolved.
- Portfolio – Portfolio Level Risks are concerns that span across the organization, multiple projects, or systems, business segments, system areas, and may be identified by the Consortium, M&O, Team Infosys and other stakeholders' leadership group.

1.2.2.3.3.2 Impact Assessment

Team Infosys assesses the impact of the risk. We either attach the assessment document in the risk management tool or update the impact analysis in the Impact Assessment text field. Team Infosys follows the approach below while doing Impact Assessment of risk:

- Who will be impacted?
- When will the risk impact be realized?
- What will be the negative result?

1.2.2.3.3.3 Risk Analysis

Qualitative Risk Analysis:

Team Infosys qualitatively analyzes the probability and impact of occurrence for each identified risk using the following approach:

Probability

- **High:** Greater than 70% probability of occurrence
- **Medium:** Between 30% and 70% probability of occurrence
- **Low:** Below 30% probability of occurrence

Impact

- **High:** Risk has the potential to greatly impact project cost, project schedule or performance
- **Medium:** Risk has the potential to slightly impact project cost, project schedule or performance
- **Low:** Risk has relatively little impact on cost, schedule or performance

Team Infosys uses the Probability and Impact Matrix below to calculate the Qualitative Risk Ranking as shown in Table 6:

Table 6. Probability and Impact Matrix

	High Probability (5)	Medium Probability (3)	Low Probability (1)
High Impact (5)	HH (High Probability, High Impact) 25	MH (Medium Probability, High Impact) 15	LH (Low Probability, High Impact) 5
Medium Impact (3)	HM (High Probability, Medium Impact) 15	MM (Medium Probability, Medium Impact) 9	LM (Low Probability, Medium Impact) 3
Low Impact (1)	HL (High Probability, Low Impact) 5	ML (Medium Probability, Low Impact) 3	LL (Low Probability, Low Impact) 1

Probability and Impact Matrix

Quantitative Risk Analysis

Team Infosys analyzes the risk events (probability * impact) to create a quantitatively risk ranking. Risks are analyzed and prioritized per their risk ranking using the risk ranking definitions:

Table 7. Risk Ranking Definitions

Risk Ranking	Overall Risk Level	Details	Approach
$RR \leq 3$	Very low or low risk level	Minor or not significant impact on the project, program or portfolio. Causes little variance from one or more objectives (e.g. schedule, quality, deliverables, product usability). For example: • Potential for 5% to 10%-time increase, but no commitments are missed • Potential for minor areas of scope to be affected, but no resource or cost impacts	• Team Infosys monitors risk but does not invest significant resources into response planning. • This Risk is placed on the Watch List and is monitored for a change in probability or impact level that may affect the priority.
$5 < RR < 9$	Medium risk level	Moderate or Normal impact to the project, program or portfolio. Causes moderate variance from one or more objectives (e.g. schedule, quality, deliverables, product usability). For example: • Potential for 10% to 20%-time increase • Potential for major areas of scope to be moderately affected • Potential for new workarounds to be needed with final product • Potential for minor impacts to quality	• Team Infosys keeps the risk in watch list. • Team Infosys prepares or monitors risk mitigation or contingency plan for implementation.

RR $\geq$ 15	High or very high risk level	Serious impact to the project, program or portfolio. Causes high variance from one or more objectives (e.g. schedule, quality, deliverables, product usability). For example: • Potential for > 20%-time increase or to miss the release schedule • Potential for major areas of scope to be unacceptably affected • Potential for final product to be unusable • Potential for new workarounds to be needed with final product • Potential for unacceptable quality reduction	• Team Infosys takes or ensures the M&O Vendor takes immediate action to implement the risk mitigation or contingency plan. • Team Infosys ensures and brings these risks to Consortium and M&O Vendor leadership.
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1.2.2.3.3.4 Risk Evaluation

Team Infosys evaluates the risk by reviewing and updating the Risk Impact Level, Risk Probability, Risk Priority, Risk Response, and Risk Type. After the Risk Evaluation, Team Infosys communicates the breadth of the risk impact to the Consortium and the M&O Vendor teams.

1.2.2.3.3.5 Risk Taxonomy

Any project team member can identify potential risks and communicate identified risks to the Project Manager. The following risk sources are identified for the project, and thereafter, Team Infosys uses these risk sources for systematically identifying risks over the life of the project.

- Requirements
- Technology
- Staffing and skill level
- Legal issues
- Cost or funding issues
- Subcontractor capability
- Purchased or customer-supplied products
- Political and/or stakeholder acceptance

Risk taxonomy checklists are an effective tool in working with individuals, groups of stakeholders, or more formalized risk workshops for identifying risks. Team Infosys uses the risk taxonomy shown in Tables 8 and 9 as a starting point for identifying the project's risk sources.

Table 8. Programmatic Risks

PROGRAMMATIC RISKS		
1. Resources a) Schedule b) Staff c) Budget d) Facilities	2. Contract a) Type of Contract b) Restrictions c) Dependencies	3. Program Interfaces a) Customer b) Associate Contractors c) Subcontractors d) Prime Contractor e) Corporate Management f) Vendors g) Politics
4. Management Process a) Planning b) Project Organization c) Management Experience d) Program Interfaces	5. Management Methods a) Monitoring b) Personnel Management c) QA d) Configuration Management	6. Work Environment a) Quality Attitude b) Cooperation c) Communication d) Morale

Table 9. Programmatic Risk Taxonomy

TECHNICAL RISKS		
1. Requirements a) Stability b) Completeness	2. Design a) Functionality b) Difficulty	3. Component Development a) Feasibility b) Testing

c) Clarity d) Validity e) Feasibility f) Precedent g) Scale	c) Interfaces d) Performance e) Testability f) Hardware g) Non-developmental h) Software	c) Coding Implementation
4. Development System a) Capacity b) Suitability c) Usability d) Familiarity e) Reliability f) System Support g) Deliverability	5. Engineering Specialties a) Maintainability b) Reliability c) Safety d) Security e) Human Factors f) Specifications	6. Development Process a) Formality b) Suitability c) Process Control d) Familiarity e) Product Control
7. Integration and Test a) Environment b) Product c) System		

Technical Risk Taxonomy

Risk Mitigation Strategy and Contingency

Team Infosys analyzes and reviews the existing and potential project risks. After this analysis, we document the risk details and work with the Consortium project management team to recommend and develop mitigation strategies and contingencies for project risks.

Risk Response

Team Infosys validates how the M&O Vendor Risk owner is determining the risk response. Team Infosys uses the definitions of risk responses below:

- Accept – No action is required, or no action is being taken for various reasons that may include low impact, low likelihood, etc.
- Avoid – This risk needs to be bypassed. The intent is to avoid the risk by changing the project in some way to bypass the risk.
- Mitigate – Action must be taken to reduce the likelihood or impact of the risk if it occurs.
- Transfer – Risk is being transferred to another organization or project or program.

Risk Response Action Plan

Team Infosys verifies that the appropriate Risk Response Action Plan is developed by the Risk Owner. Team Infosys ensures that the above action plan is based on the Risk Assessment results. Team Infosys understands that the Action Plan addresses the Risk Response Decision. Table 10 below represents a Risk Response Action Plan:

Table 10. Risk Response Action Plan

Risk Response Decision	Action Plan Addresses
Accept	No Risk Response Action Plan – note in the Comments area the reasoning for accepting the risk
Transfer	• Identify new Risk Owner/Release and Transfer date • Identify date that Risk Transfer meeting is completed • Indicate milestone dates for completing the “transfer” steps
Avoid	Identify, plan, and document the steps to avoid/eliminate the Risk Indicate milestone dates for completing the “avoidance” steps
Mitigate	• Identify how the Risk Impact is prevented or reduced • Identify the steps to mitigate Risks • Indicate milestone dates for completing the “mitigation” steps

Contingency Plan

Team Infosys reviews the Risk Contingency Plan of all the Critical, High and Medium Priority Risks. Team Infosys validates the aspects below that the Contingency Plan should address:

- “What is the plan if the risk is realized?”
- “When should the risk be escalated to the next level?”

Risk Tracking and Control

Throughout the lifecycle of the CalSAWS project, Team Infosys monitors and tracks the risks. The approach Team Infosys uses for Risk Tracking and Control is as follows:

- Reviewing to determine if probability, impact, or priority assessments have changed.
- Validating the Risk mitigation/handling and contingency plans to determine if they are up to date and if additional action is to be taken.
- Verifying how the new risks are getting documented, assessed, updated and managed.
- Reviewing the mitigation plan for identified risks
- Re-evaluating the status of the existing risks at predefined milestones during the project
- Constantly monitoring all of the risks with High Probability and High Impact

Project Issue Tracking Process Review

Team Infosys verifies and validates the existence and institutionalization of an appropriate project risk tracking mechanism process that documents risks as they arise, enables communication of risks to proper stakeholders, documents a mitigation strategy as appropriate, and tracks the risk to closure and suggest the recommendation for risk management process improvement. This should include but is not limited to technical and development efforts and is communicated to the CalSAWS Project Team.

Risk Communications and Reporting

Team Infosys communicates all risks identified through the normal Quality Assurance role as part of weekly status meetings and monthly QA reports. These reports include but are not limited to Risk id, name, description, priority, escalation level, owner, probability, impact level, mitigation details, risk status with visual indicators and risk updates.

Risk Escalation

Team Infosys escalates the critical and high priority risks when the expected goals/results are not being achieved by the identified Risk Response Action Plan steps.

Risk Closure

Team Infosys ensures that the risk is closed if and only if all the steps identified in the Risk Response Action Plan are met, i.e. the risk is managed, or the risk is deemed a non-risk. Team Infosys also encourages the Risk owner to communicate to all the Stakeholders and provide a consensus of risk closure. This decision is updated and recorded in the Risk Management Tool and the stakeholders are informed. Once the risk has been resolved, Team Infosys ensures that the Resolution field is updated as appropriate to describe the final solution, we communicate the resolution to the originator, risk owner, and appropriate Consortium and M&O escalated level personnel. Team Infosys tracks the updates in the Risk Management Tool for the Risk, verify the Status is set to complete/closed, the Date Closed, resolution Comments and note the variance between the Resolution Target Date and the actual Date Closed. At the close of the project, all Risks are labeled as closed. During project close, the M&O Project Manager closes all project risks.

Lessons Learned and Process Improvement

Team Infosys gathers and documents the detailed lessons learned and root cause analysis that are observed during the entire Risk Management Process and reports the recommended improvements to the Consortium Team to secure the necessary approvals for the recommended improvements roll out and implementation.

By integrating a structured risk assessment framework, advanced tools and techniques, and a robust prioritization strategy, Infosys ensures a comprehensive QA process for detecting and addressing high-risk and high-urgency areas within CalSAWS eligibility system and its operations. This approach aligns with the CalSAWS objectives of improving program efficiency, compliance, and service delivery quality.

1.2.2.4 Examples from Previous QA Projects

Team Infosys applied a risk-based quality assurance (QA) methodology in our past engagement with CalWIN tailored to the unique needs of CalWORKs, CalFresh, Medi-Cal, Foster Care, Refugee Assistance, County Medical Services Program, and General Assistance/General Relief Programs. Our approach combined data analytics, policy impact assessments, and real-time system monitoring to proactively identify high-risk and high-urgency areas that could affect eligibility determination, benefit issuance, or compliance.

Improved Security Posture – Vulnerability Management, Security Awareness Training, Security Assessment

Upon entry into the CalWIN project, there were over 39,000 vulnerabilities within the ecosystem. Many of the server patching levels were more than two years old. Out-of-date software and hardware, where patching is no longer available, contributed to this total. Still, a significant percentage included missing patching for the current system and application software. Systems were missing patches as far back as 2002. Additionally, the organization did not have formal security assessments or training programs.

Infosys worked with the M&O vendor and the client to establish a patching plan that reflected the availability of the environment. The plan included a goal of an N-1 patching level for all applicable assets. This plan concluded with monthly Windows patching, quarterly Linux, and bi-annual HP-UX patching schedules. The plan also included establishing yearly reviews to ensure continued monitoring of the process and plans.

Infosys developed a security awareness course for the organization, complete with placards and signage to enforce critical topics. We worked with senior management to get their buy-in for the course while also getting their feedback on its content, delivery methods, and overall logistics. The content and structure for the training program were derived from various sources, including NIST, KnowB4.com, HHS.gov, and other key providers. Also included content that was specific to the organization. The efforts represented a collaborative effort between several departments within the organization, including legal, HR, marketing, operations, and the executives. In addition to developing and producing the course, We also conducted the training sessions for the 80-member staff.

Infosys established an internal assessment process based on NIST 800-37/53 publications, which helped to identify gaps in the security posture of the ecosystem. Two years later, the organization was required to have SOC audits. Because of the assessment built around NIST, we assisted M&O Vendor to pass the audits.

Our solutions resulted in reduced security vulnerabilities, enhanced vulnerability management, detailed security awareness training process, and assisted M&O Vendor to pass the SOC audits.

ALM Source Library Synchronization: CalWIN had a huge number of requirements, i.e., around 40,000 requirements in ALM Source library. These requirements get updated (added/modified/retired) for every change request projects in CalWIN. Infosys observed synchronization delay of project requirements into/from Source repository. Infosys worked with various key stakeholders (M&O vendor) and established a detailed clear process for Requirement Synchronization in Source Repository.

It reduced delays in ALM Requirements synchronization from completed Operational projects to Source. It hence reduced the usage of incorrect/outdated requirements of existing projects for upcoming projects. Also, it mitigated the risk of requirements related rework in the project lifecycle.

Improvements to Client Correspondence (CC) Notices: Infosys observed a pattern of issues related to incorrect/non approved code getting deployed into Production or UAT environments during the implementation of any Client Correspondence changes (regulatory/policy changes and Weekly CC maintenance activities). Infosys suggested establishing a detailed Client correspondence configuration management process to avoid any configuration/propagation issues. We also suggested a detailed CC PROD/UAT deployment checklist and review checklist.

CC Configuration and code propagation issues were completely resolved post implementation of above solutions.

Mitigating COVID-19 Emergency changes impact for CalWORKs and CalFresh: Changes were made to the existing SAWS automated system to prevent the cases from discontinuing for various CalWIN social welfare programs. As part of COVID-19 related changes in CalWIN: Redetermination/Recertification/Renewal (RRR) and Semi-Annual Reporting (SAR 7) requirements were waived off due to COVID 19 for CalFresh and CalWORKs. Time clock exemption for CalWORKs was applied, and RCA would not discontinue until pandemic end. Infosys collaboratively suggested a detailed data analysis that needs to be done on all the cases where COVID-19 changes were applied and verified against the data from other consortium counties to ensure that the data can be processed together post migration.

Due to close collaborative work and suggestions, Counties RRR and SAR7 processing effort was reduced, several counties' questions on new process were resolved. Further, the high risk with normal process for an anticipated impact due to these emergency changes and impact on migration of CalWIN to CalSAWS was reduced.

Reduced Risk of Post migration data issues for GA/GR Programs Business Functions: The three SAWS systems have different approaches to support the Counties GA/GR efforts. The Leader Replacement System (LRS) includes comprehensive GR functionality specific to LA County's business processes for serving 60,000 active GR cases. The C-IV System had a minimalist shared solution for issuing and managing GA/GR benefits. CalWIN had a configurable, highly automated solution tailored for 18 Counties. Infosys recommended the following: utilizing the CalSAWS provided cloud infrastructure to host the GA/GR service and GA/GR Notices service modules. Utilizing CalSAWS core functionality wherever possible to minimize the GA/GR specific effort. Providing configuration (eligibility rules) maintenance to allow County flexibility similar to that provided in the current CalWIN system. Providing the existing correspondence functionality of Notice CalWIN as it relates to GA/GR.

This reduced risk of post migration data issues in common functionalities (common functions (Data collection, Fiscal, Employment services, Interfaces, Issuances, Batch EBT, etc.)). Reduced the challenges in data mapping the existing data structures of GA/GR into CalSAWS data

structures, and also in re-platforming the CalWIN GR eligibility within the CalSAWS business rules engine.

We utilized the above stated Risk and Issue management strategies which enabled us to prioritize QA efforts on modules and processes with the highest potential for disruption.

Outcome and Impact

This integrated approach to risk and issue management enabled team to:

- Minimize manual workarounds and eligibility errors.
- Reduce financial risks associated with overpayments and audit findings.
- Enhance system reliability and stakeholder collaboration.
- Support counties in delivering accurate and timely benefits to vulnerable populations.
- Effective risk management in hardware upgrades, security patching, and software updates ensured system stability, minimized downtime, and protected against vulnerabilities.
- It enabled proactive identification and mitigation of potential issues, leading to improved performance, enhanced security posture, and uninterrupted service delivery for end users and stakeholders.

By combining structured Risk & Issue management processes with collaborative engagement, Infosys ensured that QA efforts were focused, effective, and aligned with the mission of hosting excellent case management for eligibility workers to efficiently distribute benefits to participants.

For risks related to Operations items involving infrastructure related to hardware and software security in the CalSAWS ecosystem, we identify risks associated with CalSAWS security and compliance controls, including compliance with the current FedRAMP and NIST standards, and recommend mitigation and remediation strategies. In this regard Team Infosys reviews and document findings of other CalSAWS Contractors' Security Deliverables for consistency with the Quality Assurance Services Plan and the associated OWDs including System Security Plans and Penetration Test Reports.

For risks related to Independent Test Requirements under QA validation involving high-risk changes, issues may come into play due to regulatory and Consortium requested SCR changes in the SNAP (CalFresh), TANF (CalWORKs) and MediCAL related programs in the CalSAWS systems. Risks related to SCR related changes pertaining to Greenlight planning, Production Readiness, Green Light and Deployment, Infosys participates and provides proactive inputs in all required planning, execution, and closeout readiness activities including Risk and Issue Identification and Management. For Independent Test Planning, Executing and Reporting activities, Team Infosys manages and executes Independent QA test planning, execution, and reporting activities, in cooperation and coordination with the Consortium, State partners, and other applicable contractors per the PCD and QA Independent Testing Plan and shared Contingency Management strategies for the identified Risks and Issues.

1.2.3 Understanding and Approach 5

1.2.3.1 Understanding

Team Infosys understands the Consortium's desire for our team, as the QA vendor, to provide improvements and recommendations associated with the CalSAWS communication approach and customer outreach efforts. This is particularly true where it involves marketing and outreach to the public, Counties and Community Based Organizations (CBOs) as well as stakeholders.

Our team is committed to continuously enhancing the collaboration model and strengthening stakeholder engagement and communication practices to ensure seamless coordination across all entities.

We perform required QA activities needed to improve communications and marketing strategies aimed at increasing visibility and outreach to the public, counties, and community-based organizations (CBOs).

Team Infosys also recognizes the continual aspirations of the Consortium to enhance communications and outreach, and our QA team is ready to assist in this endeavor. As discussed herein, we propose addressing these needs with an approach that addresses two major areas:

1. Improve transparency in the communication process to the impacted County Eligibility workers and respective County/CBOs stakeholders in the event of partial or complete outages.
2. Improve communication with the public and BenefitsCal stakeholders to strengthen their engagement by enhancing communication and marketing strategies that promote awareness, access, and adoption of the BenefitsCal system. This includes developing comprehensive outreach programs, improving digital and multimedia materials, managing special event publicity, and increasing stakeholder involvement in user-centered design and experience testing.

1.2.3.2 Approach

As the QA vendor, while our role supporting the communications and outreach activities is limited, we still foresee the ability to play a very active role. Through our innovative ideas and ability to assist by quantifying how existing and emerging technology and tools can improve the collective CalSAWS processes, we assist the collective team as we collaborate and enhance the community's CalSAWS Project perception. Accordingly, two specific areas and the associated approach for each are identified below:

Improve the Outage Notifications Process

To improve communications regarding outage notifications the Infosys QA team approach includes a comprehensive systematic review of the potential events and the entities subsequently needing to receive notification for all types of CalSAWS interruptions. While outages occasionally range from a minor local event to major disruptions impacting multiple Counties. During these events, standardized notifications and communication processes are implemented but we recognize that gaps in communications do occur and interested parties have not always been fully informed regarding the status of an outage.

Team Infosys is ready to assist the Consortium achieving their vision of a greater degree of transparency and information dissemination about CalSAWS outages to interested entities and stakeholders. In addition to the established standard notification processes, Infosys proposes expanding the approach by leveraging the ServiceNow tool or another automated workflow tool for improvement in notification process. Our approach includes:

- Defining Clear Communication Escalation Paths
 - Tiered Notification System: Create levels of incident severity with corresponding communication protocols (e.g., minor, major, critical). Critical event alerts can be published to a broader group for knowledge.
 - Stakeholder Matrix: Ensure the right stakeholders (e.g., Consortium Product Owners, impacted County/Counties) are notified based on severity.
- Introducing a Centralized Outage Dashboard

- Live Status Page: Maintain a public or internal dashboard showing real-time system health, outages, and recovery timelines.
- Historical Logs: Include past incidents for transparency and trend analysis.
- AI-Based Correlation: Use analytics to correlate user reported issues or tickets with system logs to identify unreported subsystem failures.
- Enable Real-Time Communication via ServiceNow Notifications
- Use ServiceNow's Notification Engine to send:
 - Email alerts
 - SMS or push notifications
 - MS Teams Notifications (via integration)
- Ensure notifications are sent to predefined distribution lists based on impact scope/system, functionality or sub-system.
- Based on prior experience implementing similar automated processes, Infosys also recommends incorporating manual oversight by team members through periodic reviews of the ticketing system. This review helps identify tickets that may have been incorrectly classified as low or medium severity but are actually impacting a larger user base. Such manual intervention serves as a safeguard to catch misclassified issues early, thereby preventing user dissatisfaction and ensuring timely resolution.

Improve communication with Public and BenefitsCal stakeholders

To address the enhancement of public communications and marketing materials, our staff analyzes the key concepts and subjects related to strategies, improvements, techniques, design, content, and feedback mechanisms involved in publications, electronic communications, and multimedia presentations. This enhanced response integrates document-supported insights to provide a comprehensive explanation.

1. Strategies for Enhancing Public Communications and Marketing Materials

Enhancing public communications and marketing materials requires a strategic approach that aligns with organizational goals and audience needs. Key strategies include:

- **Target Audience Analysis.** Understanding the demographics, preferences, and behaviors of the target audience is foundational. Infosys emphasizes the importance of segmenting audiences based on customer data and insights derived from tools like Adobe Real-Time Customer Data Platform (RTCDP). This segmentation enables personalized communication initiatives tailored to specific customer groups.
- **Integrated Marketing Communications (IMC).** Infosys advocates for consistency across all communication channels, including inbound and outbound communications. Tools like Adobe Journey Optimizer and Marketo are leveraged to ensure seamless integration of email campaigns, website content, and other digital touchpoints.
- **Content Strategy Development.** Infosys emphasizes the creation of purpose-driven content tailored to Business-to-Consumer (B2C) and Business-to-Business (B2B) audiences. For example, B2C customers may prefer experiential and multi-channel engagement, while B2B customers prioritize concise and accurate product information.
- **Utilization of Data Analytics.** Infosys integrates analytics tools to assess campaign performance and refine strategies. For example, agile refinement techniques allow for testing and optimizing multiple campaign variants, ensuring alignment with market dynamics and customer preferences.

2. Improving Publications, Electronic Communications, and Multimedia Presentations

- **Publications**

- *Content Quality*: Publications should be well researched and engaging. Infosys emphasizes the importance of aligning content with audience needs and avoiding jargon.
- **Visual Appeal**: High-quality graphics and infographics enhance readability and engagement.
- **Electronic Communications**
- *Personalization*: Can use CRM tools to personalize communications based on user behavior and preferences.
- **Responsive Design**: Ensuring mobile-friendly and accessible designs across devices is critical.
- **Multimedia Presentations**
- *Interactive Elements*: Features like polls and quizzes actively engage audiences.
- **Storytelling Techniques**: Narrative-driven presentations make content relatable and memorable.

3. Specific Techniques or Tools for Enhancement

Based on prior experience from other engagements, a range of tools can be employed to enhance communication materials:

- **Graphic Design Software**: Adobe Creative Suite for visually appealing designs.
- **Content Management Systems (CMS)**: Adobe Experience Manager for managing electronic communications.
- **Email Marketing Tools**: Marketo for automating and personalizing email campaigns.
- **Presentation Software**: Prezi and Microsoft PowerPoint for dynamic multimedia presentations.

4. Role of Design and Content in Effectiveness

- **Design**: Infosys emphasizes the importance of consistent branding elements, such as colors, fonts, and logos, to reinforce brand identity. A well-thought-out design enhances user experience and makes materials more engaging.
- **Content**: High-quality content establishes authority and trust. Team Infosys advocates for tailoring content to audience needs, ensuring clarity and relevance. Calls to action should guide audiences toward desired outcomes.

5. Incorporating Feedback into Enhancement

- Feedback mechanisms are integral to continuous improvement:
- **Surveys and Polls**: Conduct surveys to gather audience insights and refine communication strategies.
- **Analytics Review**: Engagement metrics, such as open rates and click-through rates, are analyzed to identify successful elements.
- **Focus Groups**: Qualitative feedback from focus groups provides deeper insights into audience reactions.

By implementing these strategies, techniques, and feedback mechanisms, the Consortium can significantly enhance the quality of public communications and marketing materials, ensuring they are effective, engaging, and aligned with organizational objectives.

Infosys is committed to fostering meaningful, inclusive, and continuous engagement with all BenefitsCal stakeholders. Our approach is designed to ensure that stakeholders are not only informed but actively involved in shaping the system's evolution. Key elements or factors of our stakeholder engagement approach include:

1. Inclusive Engagement Framework

- Understand and suggest improvements to structured engagement forums such as stakeholder councils, advisory groups, and feedback loops.
- Ensure representation from diverse stakeholder groups including counties, CBOs, advocacy organizations, and end users.
- Promote equity and inclusion by incorporating multilingual and culturally relevant engagement practices.

2. Active Participation in UCD and UX Processes

- Facilitate stakeholder involvement in the User-Centered Design (UCD) lifecycle, from discovery to validation.
- Conduct regular User Experience (UX) testing sessions with stakeholders to gather actionable insights and improve usability.
- Use co-design workshops to collaboratively develop features and workflows that reflect real-world needs.

3. Transparent Communication Channels

- Implement a centralized stakeholder communication portal for updates, documentation, and feedback.
- Share regular progress reports, roadmaps, and release notes to maintain transparency and build trust.
- Use surveys, polls, and interactive sessions to gather continuous input and measure satisfaction.

4. Capacity Building and Empowerment

- Provide training, toolkits, and coaching to empower stakeholders to effectively participate in system development and outreach.
- Offer “train-the-trainer” programs to extend knowledge within stakeholder organizations.
- Recognize and incorporate stakeholder contributions into planning and decision-making processes.

5. Continuous Improvement through Feedback

- Establish a formal feedback management process to track, analyze, and act on stakeholder input.
- Use data-driven insights to refine engagement strategies and improve responsiveness.
- Maintain an agile approach to adapt engagement methods based on evolving stakeholder needs.

In summary, the Team Infosys approach is fully aligned to process improvements associated with communications and outreach on behalf of the Consortium. Our QA team is ready to work as an active collaborator in delivering on the vision of the Consortium.

1.2.3.3 Prior CalWIN Example

Infosys supported oversight and QA for implemented structured communication protocols to ensure timely and effective dissemination of information to Subject Matter Experts (SMEs) and stakeholders regarding planned changes that may impact on their areas of responsibility or any planned Infrastructure activities causing planned system outages. Our approach emphasizes transparency, collaboration, and proactive engagement.

During our previous engagement with the CalWIN project, Infosys played an active role in managing administrative processes and publishing communications—such as County Information Transmittal (CITs), County Requests for Information (CRFIs)—to County stakeholders and SME groups. These communications were delivered using standardized templates to ensure clarity, consistency, and conciseness. Each message was collaboratively reviewed with

SMEs and product owners to gather feedback and confirm that all relevant information was included. This ensured stakeholders had a clear understanding of planned system changes, including key details such as the nature of the change (What), the timeline (When), and a high-level overview of the implementation approach (How) and if any action or input required by when. Also, setting up and following defined escalation path when required response was provided by the due date. The QA team also contributed by reviewing initial drafts and recommending improvements to enhance the quality and effectiveness of the notices.

Infosys team also performed periodic oversight of reported tickets to check for any major incidents to escalate the reported issue with Operations and Incident Managers which can potential impact high volume of users, requesting resolution ETA from vendors and ensure timely and transparent communication of the outage incident with County users and other partner Agencies.

Below are the standard strategies or techniques which were used to ensure timely, clear communication for the stakeholders:

- Centralized Notification Framework
- Established and maintained a unified notification format for publishing change notifications, ensuring consistent messaging across all stakeholder groups.
- Stakeholder Mapping and Impact Analysis
- Identified relevant SMEs and stakeholders based on functional and technical domains for feedback to assess potential impact of changes to tailor communication accordingly.
- Maintain Distribution Group List
- Periodically reviewed, the Distribution Group contact list is updated to include any changes in the staff.
- Automated Alerts and Scheduling
- Deploy automated notification systems integrated with project management tools to ensure timely alerts for upcoming changes.
- Feedback Collection Mechanism
- Enabled structured feedback loops through surveys, comment forms, and stakeholder review sessions to gather inputs.
- Escalation Protocols
- Defined escalation paths for unresolved concerns or critical feedback to ensure timely resolution and stakeholder satisfaction.
- Training and Awareness Sessions

Below are the key learnings and points from the past project experience to note during our QA activity related to enhancing communication process for CalWIN Project-

- Avoiding Communication Overload
- Ensured notifications are concise, relevant, and targeted to avoid overwhelming stakeholders with unnecessary information.
- Version Control and Audit Trails
- Maintained detailed logs of notifications and stakeholder responses to support traceability and compliance.
- Validation of Stakeholder Lists
- Periodically reviewed and updated stakeholder contact lists to ensure accurate and complete dissemination.
- Contingency Planning
- Including information on fallback strategies, including rollback procedures and interim support mechanisms.

- Security and Confidentiality
- Ensured all communications adhered to data privacy and security standards, especially when sharing sensitive information. Using encrypted emails while communicating any information with PII/PHI data.

1.3 Sub-Section 5.2.3.3 – Software Development Lifecycle

1.3.1 Understanding and Approach 6

1.3.1.1 Understanding

Team Infosys clearly understands the Consortium's visions for CalSAWS as many of the objectives are collectively associated with process improvements. In this regard, an important aspect that differentiates our proposal from others is our assessment as a Capability Maturity Model Integration (CMMI) Level 5 organization. This is the highest maturity level, and it recognizes our processes and procedures to deploy continuous process optimization. As part of this proposal, our team leverages our previous work with the Consortium to expediently align with the latest processes and procedures as a key tenet included in our approach. With our full alignment to the current methods, our team works collaboratively with the numerous organizational entities to enhance all aspects of the services delivered by the CalSAWS Project which is also an integral part of our approach. Our assessment and delivery of structured methods coupled with our prior experience performing QA services allow us to quickly deliver tangible results to the Consortium. These results include the standard scheduled deliverables in addition to delivery of continuous process improvements through quantitative feedback and innovative ideas applied throughout the Software Development Life Cycle (SDLC).

Team Infosys is fully aware of and understands the Consortium's defined requirements for the CalSAWS M&O vendor specifically aimed at streamlining the timeframes for promulgating application changes to the Counties. In this regard, our team works with the Consortium, CalSAWS M&O vendor and other key stakeholders to ensure the CalSAWS project activities and M&O vendor align to the improved CalSAWS SCR processes to reduce the overall time from inception to deployment of system changes.

Infosys completely understands System Change Requests (SCRs) are the documentation used to track all functional changes to the system and the complete lifecycle of the existing CalSAWS SCR process including six major processes starting from CalSAWS Enhancement Requests (CERs) to SCR Implementation. Further, we recognize the impact of changes to the BenefitsCal application may have on other functional areas of the CalSAWS system. To this end, we verify and validate the SCR process and CalSAWS Policy Implementation Timeline is followed and implemented in CalSAWS to preclude system issues. As the current SCR process is evolving to align with agile development methods, Team Infosys leverages our proven Agile project experience to ensure the detailed focus on collaborative decision-making, customer input and satisfaction, and development over multiple short cycles or sprints are followed in CalSAWS. Our participation in User Centered Design activities and Collaboration Model meetings enable our recommendations for improvements to the Consortium. Overall, the Team Infosys understanding of the SCR processes and ability to provide innovative solutions for more efficient and effective software development techniques and tools. This insight spans from the CalSAWS Enhancement Requests (CERs) through SCR (creation, prioritization & approval), Design collaboration, Design (Business, Functional & Technical), Estimations, Release assignments, CCB review & approvals to SCR Implementation activities such as build, test, release greenlight approval, release notes distribution, Production deployment and Lessons learned for future improvement recommendations.

Our team recognizes our overall responsibility for providing QA of activities defined within the other CalSAWS contractor agreements to include:

- Reviewing and recommending improvements to other CalSAWS contractor processes, activities and Operational Working Documents (OWDs).
- Reviewing and documenting findings associated with other contractor project deliverables and work products, including project management, SCR and SCR-related, marketing and public communications, enhancement and innovation, operations and security.

As such, Team Infosys performs a range of QA SCR process activities in cooperation and coordination with the Consortium and other CalSAWS contractors. This includes providing QA of other CalSAWS contractor SCRs and related activities, consistent with the Quality Assurance Services Plan and the associated OWDs.

Further, our prior experience working with the Consortium resulted in our strong recognition of the importance of significant involvement, communication and collaboration with stakeholders and advocacy groups in CalWIN's public facing MyBenefitsCal CalWIN (MyBCW). Accordingly, our QA team ensures:

- The same level of engagement continues during the ongoing BenefitsCal work in accordance with the Collaboration Model.
- Impacts and implications of updates to one system modifications on other systems are fully considered and implemented accordingly.

And finally, with our proven experience in public sector clients (in states such as CA, CT, DC, and TX), we demonstrated our understanding for flexibility in adapting QA processes and services to support any additional or future capabilities being developed and implemented in CalSAWS and BenefitsCal projects.

1.3.1.2 Approach

In advancing the CalSAWS Project, our approach includes a full review of the existing System Change Request (SCR) processes and documentation, with an eye towards introducing numerous enhancements to current activities throughout the life cycle. This review ensures our understanding and adherence to the established processes. As such, in the following paragraphs, we first provide descriptions of numerous potential enhancements that may bring the Consortium visions into reality. Thereafter, we walk through the full SCR Review process highlighting areas where these enhancements are potentially applicable. During actual execution, these potential enhancements are discussed with the Consortium and relevant stakeholders to gain consensus. After receiving the receipt of Consortium directives, we work cooperatively through defined processes to support the implementation of directed changes.

1.3.1.2.1 Potential Innovative Solutions for CalSAWS SDLC

Per Consortium expectations, Team Infosys brings innovative solutions to improve the efficiency and effectiveness deployed within the software development techniques and tools employed by the collective team. We ensure that Quality Assurance (QA) is applied from the beginning to each SDLC phase of the CalSAWS Project and this includes suggestions throughout the multi-vendor environment. We firmly believe providing innovative solutions for more efficient and effective software development from a QA standpoint involves a blend of strategic thinking, strong collaboration with key stakeholders, process optimization, and leveraging modern tools and techniques. As such, our team first reviews existing processes before recommending enhancements to assist the Consortium in driving innovation into the CalSAWS Project. Several

of the potential solutions our team anticipates implementing as we support bringing Consortium key visions to fruition are noted below:

- Shift-Left QA Practices
- Automated Impact Analysis
- Quality Engineering Mindset
- Metrics-Driven QA
- Continuous Testing in CI/CD
- Test Data Management and Virtualization
- Exploratory and Context-Driven Testing
- Artificial Intelligence and Machine Learning in QA
- Robotic Process Automation

Each potential solution is discussed further below. These recommendations are enhanced and solidified through collaborative discussions with the Consortium and key stakeholders to ensure full alignment with the CalSAWS Project needs:

- Shift-Left QA: Move QA activities earlier in the development lifecycle for early detection of defects, reduced cost of fixing bugs, and facilitating faster feedback loops. We drive the shift-left activities through our QA team involvement in requirement gathering, planning and design discussions phases to review user stories, acceptance criteria, and design documents. We provide early suggestions such as helping the project team to understand state policy clearly or assessing the impact of any open policy questions, notices impact, identify any competing priorities, and best scheduling window. In this manner, we support the Consortium in identifying ambiguities, missing requirements, and potential risks early.
- Automated Impact Analysis: Leverage tools that analyze dependencies and predict the impact of changes to help in faster decision-making and risk mitigation. We identify the potential effects of a proposed change across the system—code, documentation, tests, dependencies, and more. We work with the Consortium to suggest best practices, techniques and tools for it.
- Quality Engineering Mindset: Transition from QA to Quality Engineering (QE) for embedding quality into design and architecture, Monitoring production metrics to improve test strategies and collaborating across teams to ensure end-to-end quality. We bring in best practices such as aligning all the key stakeholders on quality attributes, defining clear quality gates, encouraging continuous feedback, and recommending team upskilling as per project needs, etc.
- Metrics-Driven QA: Use actionable metrics and visualization dashboards to guide QA decisions. Activities we suggest: Defining Clear QA Objectives, Identifying Key QA Metrics, Making Metrics Actionable, Review and Refine Regularly and Fostering a Metrics-Driven Culture.
- Continuous Testing in Continuous Integration / Continuous Deployment (CI/CD) Pipelines: Integrate automated testing into every stage of the CI/CD pipeline and use of best practices such as automating unit, integration, and regression tests, and containerized environments for consistency. By bringing Continuous Testing into a project using CI/CD pipelines ensures that testing is automated, integrated, and executed throughout the development lifecycle.
- Test Data Management and Virtualization: Use synthetic data and service virtualization to simulate complex environments for faster test execution and reduce dependency on unavailable/complex systems. We work with the Consortium and project teams to suggest how to automate data provisioning activities including data masking, Integrating with CI/CD, and Identifying data required for different test scenarios and classifying data: static vs dynamic, sensitive vs non-sensitive.
- Exploratory and Context-Driven Testing: Encourage testers to explore beyond scripted tests using techniques such as session-based test management and risk-based testing.

Introducing Exploratory Testing and Context-Driven Testing into a project helps uncover hidden issues, adapt testing to real-world scenarios, and improve overall software quality.

- Artificial Intelligence (AI) and Machine Learning (ML) in QA: Use responsible AI/ML to optimize test coverage and predict defect-prone areas for smart test case generation, visual testing using AI, and predictive analytics for defect trends. We work with our QA team to have significant enhancement in the efficiency, accuracy, and adaptability of testing processes in a project by using Smarter Test Case Generation, Predictive Defect Analysis, Test Optimization, Intelligent Test Execution, Anomaly Detection in Logs and Metrics, Continuous Learning and Improvement. This AI and ML powered approach is used responsibly in various SDLC phases of SCR. Further details about our AI approach are outlined in Understanding and Approach – 8.
- Robotic Process Automation (RPA): Automate repetitive tasks in requirement gathering, testing, and reporting. By introducing Robotic Process Automation (RPA) into a project significantly improves efficiency, reduces manual errors, and frees up team members for higher-value tasks. We work with the Consortium and project teams on various feasibility aspects like identifying suitable processes for automation, Choosing the right RPA tool and techniques, and how to integrate with existing systems.

During our complete SCR Review as described below, the Infosys QA team focuses on automation, collaboration, intelligence, and traceability. Below we elaborate on our QA approach for CalSAWS Software Development lifecycles analysis and review processes.

1.3.1.2.2 SCR Review

Infosys completely understands the SDLC of CalSAWS from CalSAWS Enhancement Requests (CERs) through SCR (creation, prioritization & approval), Design collaboration, Design (Business, Functional & Technical), Estimations, Release assignments, CCB review & approvals to SCR Implementation activities such as build, test, release greenlight approval, release notes distribution, Production deployment and Lessons learned for future improvement recommendations.

To ensure ongoing processes are effective and efficient, Team Infosys performs a full QA analysis and review of each activity within the CalSAWS SDLC. We ensure that all the SDLC documentation, processes and activities are thoroughly reviewed before any production implementation.

This review includes already approved deliverables and processes to identify any key missing processes or any enhancements to processes. For any changes, Infosys works with the Consortium, M&O Vendor and other key stakeholders to get it modified, approved and baselined.

Team Infosys also reviews and recommends improvements and/or efficiencies associated with the Consortium's annual production release schedule and bi-monthly releases. This activity includes reviewing, analyzing, and validating independently all the M&O Vendor application changes, project deliverables and work products using Infosys-created review process guideline documents and respective deliverable document checklists. After this review, Infosys makes appropriate recommendations for improvements. Infosys' objective towards modification and enhancements is to ensure all changes are assessed, approved, implemented, and reviewed in a controlled manner and follow due diligence to implement and adhere to the defined governance processes instantiated by the Consortium. Our SCR deliverable review process is depicted below in Figure 2.

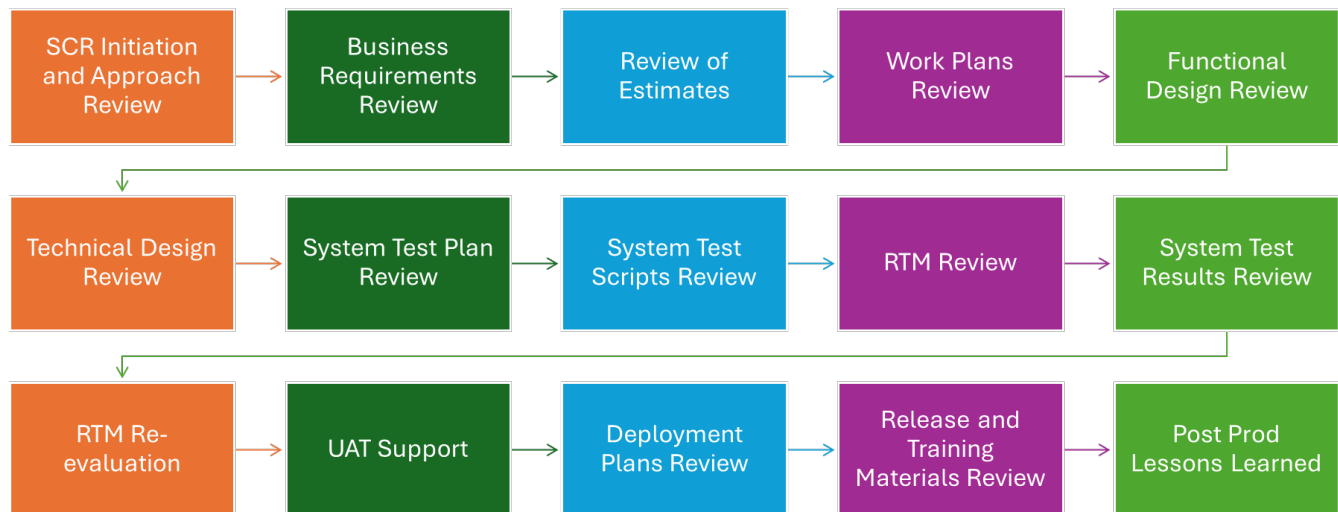


Figure 2. M&O Vendor SCR Deliverable Review Process

Each step of our review process depicted within Figure 2 is explained within the following subparagraphs.

SCR Initiation and Approach Review

We have learned from prior experience in similar engagements, the reason for the SCR can result from a State policy letter, a request from a County or created by a CalSAWS team member, Non-State policy related enhancement (CalSAWS Enhancement Request (CER)), Single County operational request such as GA/GR rules, All County Letters (ACLs), Business problems, Underlying business drivers, Regulatory mandates, Legal mandates, Strategic decisions, Operational excellence related upgrades, Maintenance, Operations, S/W & H/W updates, County Direct, and Change Orders, etc. Infosys staff have a clear understanding of these different kinds of changes based directly on our CA experience and we provide input to the Consortium on the aspects below (including but not limited to) for assisting the Consortium determine if they should go ahead with SCR SDLC or reject the request:

- Impact of the change
- Risks, issues, dependencies and assumptions
- Relative prioritization of the SCR
- Suggesting the best available release cum timelines for its production implementation

As part of our analysis, Team Infosys examines the SCR implementation approach to validate the changes for the requirements that have been analyzed for appropriate granularity while estimating the effort, timelines and cost. After CCB approval of the SCR requirements, Infosys validates and monitors the SCR implementation activities and all the associated tasks required to meet the quality objective of the Consortium. As we gain more understanding of current SCR process, we anticipate suggesting some innovative techniques such as

- Usage of Contextual Review Templates (or dynamic templates) that adapt based on type of changes (bug fix, feature, refactor), Affected system (UI, backend, API), and Risk level.
- Including checklists tailored to each context.
- Experimentation-Driven Reviews where QA reviewers assess not just change, but the intent and expected outcome along with anticipated risks and issues.

Our team also confirms system modifications adhere to the Consortium's DevSecOps practice, and to the American with Disabilities Act (ADA) Standards for Accessible Design, Section 508 of the Rehabilitation Act.

Business Strategy and Business Requirements Review

While evaluating the requirements, Infosys focuses on identifying the level and type of impact to CalSAWS business operations to be introduced as part of the SCR and suggest the impact, risks, issues, etc. as early as possible in lifecycle phases e.g., Planning, Design Collaboration, Design & Target Release Assignment, CCB Approval, Business Strategy Meetings, High Level Requirements and Design Phases. Infosys actively takes part in JAD sessions along with all stakeholders viz. business users, interface partners and other stakeholders to clearly identify all the changes required in the current system functionality and other related sub-systems. Infosys examines the aspects below during this activity:

- Level and Type of Impact – Complexity of system change request to the requirements, impact on current functionality, scope changes and related risks and issues, in scope, out of scope, high level requirements, solution options, alternative approaches, assumptions, constraints, or the extent of business problem or driver is that needs addressed.
- Infosys analyzes all the implications which can result from a new or changed State, Federal, or County-mandated policy or regulation, changes in County business needs, services, or technological changes and reviews the effectiveness of proposed target production delivery date.

We recommend AI-Powered Business Strategy Impact Analysis to gain AI advantage of:

- Analyzing historical data to predict ROI or customer impact.
- Clustering similar past changes and their outcomes.
- Recommending whether to proceed, pivot, or delay based on trends.

Additionally, Infosys recommends training requirements that should be considered as part of the change management process.

Review of Estimates and Cost

Infosys is well versed with various estimation methodologies like Function Point, Nesma, SMC Estimation etc. From our experience of supporting similar kinds of projects in Social Welfare Programs including for CA state, Infosys has proven knowledge, experience and data for categorizing modifications in different estimation models and the threshold efforts to be considered against each category and we follow the approach depicted in Figure 3 below.

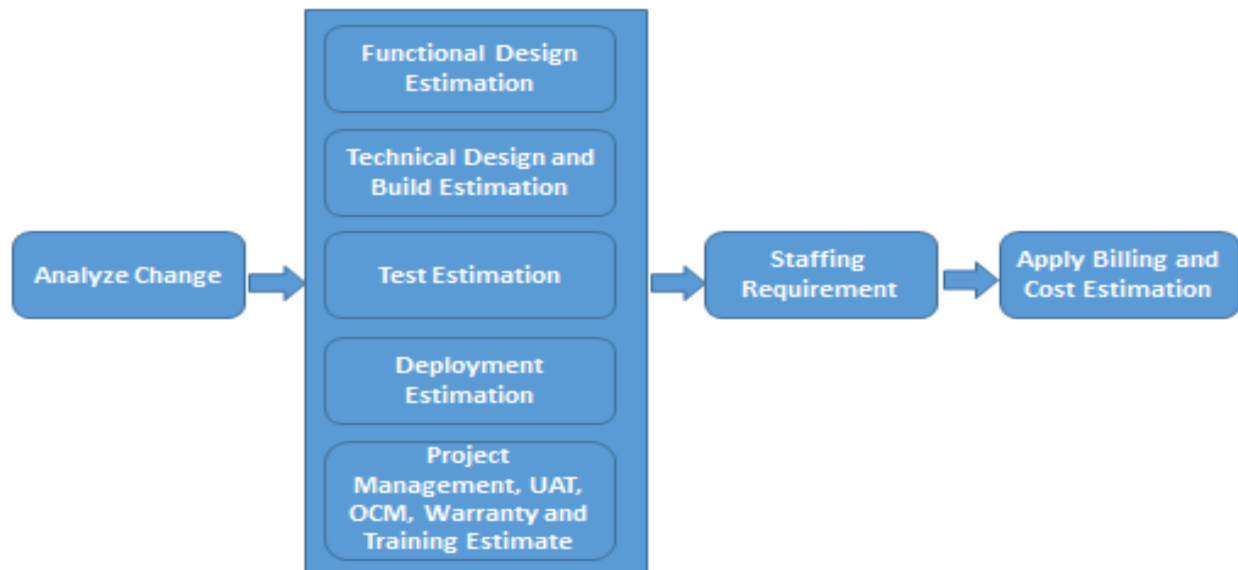


Figure 3. SCR Estimation Approach

Infosys validates the change request deployment schedule on the level of effort and resources required to meet the target production delivery time and assesses any impact on the county operations or Project plan. Infosys validates the schedule based on following aspects of level of effort and resources:

- Level of effort – Complexity of change request, impact on current functionality, scope changes and related risks and issues
- Resources – Resource (Details, Role, Loading, Total positions, Fulfilled positions, Not Fulfilled positions and Total Hours), Verify and Compare Baselines

In the case of an anomaly or probability of significant impact, Infosys recommends remediation for the left or right shifting of the scheduled delivery.

Here are some innovative ways to review the estimates and cost that go beyond traditional spreadsheet-based or static review methods such as using AI-Powered techniques to:

- Validate effort and cost estimates
- Flag anomalies or underestimations
- Suggest more realistic timelines based on complexity and team velocity
- Perform Estimation Retrospectives

Work Plans Review

Key factors for overall project timelines and timeliness are work plans and schedule adherence. Using our knowledge of the Consortium's defined requirements for the CalSAWS M&O vendor specifically aimed at streamlining the timeframes for promulgating application changes to the Counties, our team plans collaborative work plan reviews. In this regard, our team works with the Consortium, CalSAWS M&O vendor and other key stakeholders to ensure the CalSAWS Project and M&O vendor adhere to the improved CalSAWS SCR processes to reduce the overall time from inception to deployment of system changes. During the reviews, we work with the Consortium regarding improvement recommendations.

The work plan provides project planning details including project tasks, predecessors, successor activities, timing and hours. During the work plan review, Infosys evaluates the Project Schedule, Milestones, Task Name, Task Status, Deliverables List, Scheduled Details (Start Date, Finish Date, Duration and Effort), Actual Details (Start Date, Finish Date, Duration and Effort),

Percentage Completion, Budget, Predecessor/Successor Activities, Project Resources Staffing Requirements, Project Resources Responsibilities, Contingency and Risk Mitigation Plans. Thereafter, we provide suggestions and recommended improvement feedback on a periodic basis to the M&O Vendor. A few key review aspects include:

- Scope – In scope, out of scope, High level requirements, Solution options, Alternative approach, Assumptions, Constrains, extent of business problem or driver is getting addressed
- Level of effort and Resources as covered in above section
- Schedule – Project Tasks, Milestones Activities, Milestones Activities Status, Scheduled details (Start Date, Finish Date, Duration in Days and Effort in Person Hours), Actual details (Start Date, Finish Date, Duration in Days and Effort in Person Hours), Percentage Completion, Target and Actual Release Assignments
- Budget – Project Cost, Work Plan Cost, Approved Budget, Pricing Range, Forecasts, Baselines, Financial Summary

Here are some innovative ways to review the work plans associated with SCRs we focus on to improve clarity, collaboration, and adaptability:

- Visual Work Plan Mapping (to create visual flowcharts or swimlane diagrams of the work plan) – It helps stakeholders to quickly grasp dependencies, timelines, and responsibilities.
- AI-Assisted Plan Evaluation – Use AI to analyze the work plan for identify Unrealistic timelines, Resource overload and Missing dependencies. AI can also suggest improvements based on historical project data.
- Scenario-Based Simulation – Simulate different execution scenarios (e.g., resource unavailability, scope creep).

Design – Business and Functional Requirements Review

Infosys' QA team works closely with the Consortium and Project teams and actively participating in the analysis and design session, and/or JADs session. Infosys brings our domain expertise in social welfare program services, and we are also an active contributor in assessing the solution towards the counties common goal of improved operation needs and compliance requirements as related to the compliance with State, Federal, or County-mandated policy or regulation changes.

To keep up to date with the compliance mandates, Infosys refers to and understands the following aspects at regular intervals: State policy letter, ACINs (All County Information Notices), ACL (All County Letters), ACWDL (All County Welfare Director Letters), CFIN (County Fiscal Information Notice), CFLs (County Fiscal Letters), Individual County Letters, Notice of Form Change (GEN 127s), Legislations and Regulations.

Infosys reviews and provides recommendations for improvements and innovation to system requirements and design activities.

The Infosys QA Analysts team reviews and validates the business and functional design details for the following aspects:

- Are the business/functional requirements addressing the business problem
- Are the business/functional requirements concise, clear, and unambiguous
- Impact of the requirements on County workers, programs, end users and workgroups
- How are the requirements affecting the existing pieces like Eligibility Determination and Benefit Calculation, Client Correspondences, Interfaces, Business Intelligence,

Database, Reference Tables, BenefitsCal, Management Reporting, Business Intelligence, Forms and other components

- Assumptions and Constraints regarding scope and coverage

Infosys analyzes the business and functional requirements with the SCR and provides the recommendations for improved requirement language as appropriate. The following are key guidelines while reviewing the requirements:

- Requirement Structure and Pattern should have clear “Who”, “What” and “Why” details
- Business requirements should not be overly detailed. It should be concise, clear and unambiguous.
- Requirements should not have vague words and phrases such as “generally”
- Requirements should not have imprecise verbs such as “supported”
- Requirements should not have implied certainty words such as “always”
- Requirements should not have passive voice
- Requirements should not have comparatives
- Requirements should not have disputed words such as “achievable”, “minimum”
- Avoid long running statements and restructure into smaller statements
- Use decision tables or visual models wherever applicable

Overall, Infosys provides innovative techniques for effective CalSAWS business and functional requirements review by focusing on enhancing clarity, collaboration, traceability, and automation. These techniques ensure that requirements are not only well-understood but also aligned with CalSAWS business goals and CA user needs. Our methods are depicted in Figure 4 below.

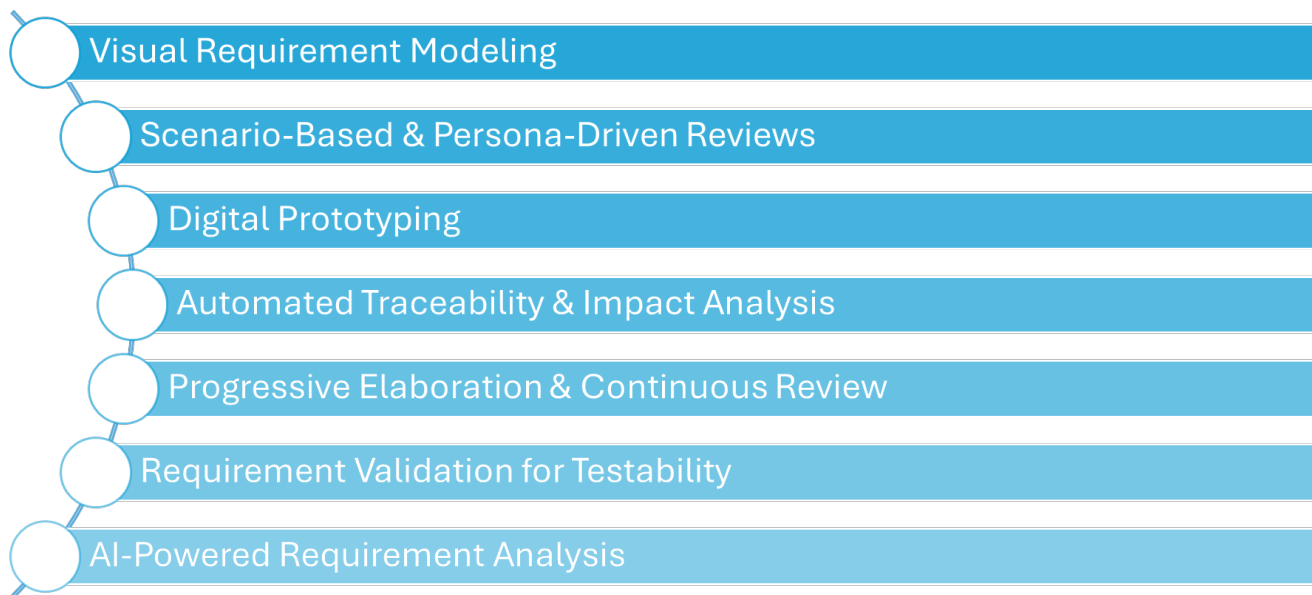


Figure 4. Innovative Techniques for Business and Function Requirements Reviews

- Visual Requirement Modeling: Use UML diagrams, flowcharts, wireframes, and mockups to visualize requirements. This helps stakeholders better understand complex systems and identify gaps early.
- Scenario-Based & Persona-Driven Reviews: Validate requirements using real-world scenarios and user personas. It encourages thinking from the end-user's perspective, improving relevance and usability.
- Digital Prototyping: Create interactive prototypes using tools. It allows stakeholders to “experience” the software before development begins.

- Automated Traceability & Impact Analysis: Use tools that automatically generate and maintain Requirements Traceability Matrices (RTMs). It helps track dependencies and assess the impact of changes across the SDLC.
- Progressive Elaboration & Continuous Review: Break down requirements into smaller chunks and review iteratively. Use rolling wave planning to refine requirements as more information becomes available.
- Requirement Validation for Testability: Simulate business processes to validate requirements against real-world scenarios. It helps in identifying bottlenecks and unrealistic expectations.
- AI-Powered Requirement Analysis: Use AI tools to detect ambiguities, inconsistencies, and missing requirements. Summarize large requirement documents and suggest improvements based on historical data and best practices.

Design – Technical Design Review

The Infosys QA team reviews the technical design details that may include but are not limited to database modifications, Reference Table (RT) table changes, and interface file layout changes. Infosys ensures that the following aspects are correctly covered in the technical design:

- High level technical approach, summary and overall system design
- Impact on infrastructure configurations, software, hardware and network
- Tables and the Programs Affected by Subsystem
- Updated Data Dictionary, Data Model, Entity Relationship diagrams.
- Reference Table changes and updates
- Impact on Integration design for Interfaces, hubs and external agencies; required changes are documented and communicated.
- Updated ICD Interface Control Documents and Data Mapping Documentation.
- Impact on Notices and their modules
- Detailed Coding Specifications by Subsystem and Module Name
- Impact on Performance and required performance tuning activity identified
- Preliminary Unit Test Cases and Expected Results
- A List of Related Changes, Issues, Risks, and Service Requests
- Affected Subsystems and Technical Services
- A List of Tools Used or Introduced in the Change
- An Updated Requirements Traceability Matrix covering all the technical requirements

Infosys' experience in implementing similar kinds of projects for Health and Human services customers are leveraged in analyzing the technical aspects in the change in architecture and the performance and functionality. Our processes leverage key components from industry standards architectural models including the Medicaid Information Technology Architecture (MITA) and The Open Group Architecture Framework (TOGAF).

Technical issues identified early are the easiest and most cost effective to fix with few impacts on the budget and schedule. In furthering this identification, our QA team works closely with the Consortium technical team with the common goal of implementing the changes in a cost-effective manner with no adverse impact on the application functionalities or affecting the performance SLAs. This process utilizes the MITA business architecture model to ensure the business vision, business processes, and capabilities are identified and applied to the target technical architecture.

A review of the proposed functional and technical application changes is performed in order to analyze the downstream technical impacts to other related subsystems and architectural

landscape and ensure the changes align to CalSAWS architectural strategies. This process leverages the MITA technical and cross-cutting architecture components to ensure data, application and technology architectures are aligned with current and future business and system requirements.

Our process also reviews the functional and technical design artifacts to ensure a robust implementation strategy is followed by validation, a smooth migration to the production environment and an efficient roll back plan. Infosys assesses the proposed technical and architectural changes by the M&O vendor to identify possible risks, issues and gaps with the designed implementation approach. As identified, recommendations are provided for alternatives including breaking down complex technical changes into phases, leveraging Service Oriented Architecture (SOA) to promote reuse, system stability, and overall system. The overall architectural governance leverages governance processes for TOGAF, including policy management, compliance, monitoring and reporting, and environment management.

Here are three innovative ways to review the Technical Design of a SCR, focusing on improving clarity, collaboration, and risk mitigation:

- AI-Assisted Design Review – Use AI to:
 - Analyze design documents for inconsistencies or missing components.
 - Suggest improvements based on architectural patterns and best practices.
 - Predict potential performance or scalability issues.
- Contextual Review Templates –
 - Create dynamic templates that adapt based on:
 - Type of change (e.g., API update, UI redesign, backend refactor)
 - Risk level and complexity
 - Include checklists for security, performance, scalability, and maintainability
- Automated Compliance Checks –
 - Integrate tools that scan design artifacts for compliance with:
 - Security standards
 - Data privacy regulations
 - Coding and architectural guidelines

System Test Plan Review

Infosys reviews and provide recommendations for improvements and innovation to other CalSAWS Contractor testing methodologies and processes. The Test Plan describes the test strategy, testing procedures, assumptions, risks, and constraints, roles and responsibilities and the approach to testing throughout the software SDLC. The Infosys team keeps their primary focus on the following areas while validating the test plan deliverable:

- Objective of test plan, test strategy and how clearly it is defined
- High level scope of testing activities, detailed In-scope features, components and activities
- Detailed in/out of scope features, components and activities
- Roles and responsibilities of Test Lead, Testers, Test Manager, QC Test Reviewers and BA/SMEs
- Overall test schedule including task name, details, start date and end date
- Details and scope of various testing types like Unit, System, Interface, Regression and Performance testing
- High level approach of test execution including test data identification, batch jobs, batch cycles and file transfer dependencies
- Entry and Exit criteria for all the testing types

- Test environment details and dependencies
- Tools required for the testing
- Testing status reporting, Defect tracking and reporting
- Testing assumptions, risks and constraints

System Test Scripts Review

The QA team reviews the same with the main focus on:

- requirement coverage as per Functional requirements
- test script mapping with the functional requirement
- How clear are the test steps and expected results?
- test script description
- test script name
- Status of the test script (it should be Ready for Review)
- Pre-requisites, Pre-Condition and Post Conditions
- Test data identification

RTM Review

The Requirements Traceability Matrix (RTM) is a document that links requirements throughout the validation process. It provides the mapping between the business requirements, functional requirements, and test scripts to validate the complete coverage of business requirements and status of respective requirements. A test management tool (ALM/JIRA or any other existing tool) has the ability to generate a RTM. As per the Infosys QA team's past experience in RTM review, team reviews and verifies the following aspects:

- Traceability – are requirements unambiguously identified? Do they include links to related requirements and to the reasons why these requirements have been included?
- Missing Traceability – Verify that all Business Requirements, Functional Requirements and Test Scripts are mapped with each other.
- Requirement Status – Verify that after test script execution all requirements should be executed with the status.
- Redundant Test - Verify that all requirements are covered within the test scripts and there are no duplicate test scripts for the same requirement.

Here are innovative ways to review the Requirements Traceability Matrix (RTM) for a SCR is by focusing on improving transparency, accuracy, and alignment with business goals:

- AI-Powered Traceability Validation: Use AI to –
 - Detect missing or broken links in the RTM.
 - Suggest test cases based on requirement descriptions.
 - Flag inconsistencies between requirements and implementation.
- Cross-Functional RTM Reviews –
 - Involve business analysts, developers, QA, and compliance officers in RTM reviews.
 - Use collaborative platforms for asynchronous feedback and approvals.

System Test Results Review

This section provides the test results for the given change request project. The QA team objective in the STR review is:

- Objective of test results report and how clearly it is defined
- High level scope of testing activities, detailed In-scope features, components and activities
- Detailed out of scope features, components and activities

- Met/Not Met status of Entry/Exit criteria that are defined in System Test Plan
- Summary of test execution results including counts/percentages of passed, failed, blocked, in progress and no run test scripts
- Summary of requirements coverage and including counts/percentages of passed, failed, blocked, in progress and no run requirements
- Defect summary and defect log verification
- Status of all the test scripts (passed, failed, blocked, in progress and no run)
- Testing artifacts validation in Defect Management Tool

Infosys provides incident analysis and evaluates other CalSAWS Contractor test results trends to detect patterns and to provide the Consortium with recommendations for test process improvements.

Here are innovative ways to review the overall System Testing of a SCR by focusing on improving coverage, collaboration, and defect detection efficiency.

- AI-Driven Test Coverage Analysis – Use AI tools to analyze system test cases and identify:
 - Gaps in coverage
 - Redundant or obsolete tests
 - High-risk areas based on historical defect data
- Cross-Functional Test Reviews –
 - Involve developers, QA, DevOps, and business analysts in reviewing system test plans
- Smart Test Data Management –
 - Review how test data is created, managed, and cleaned up.
 - Use synthetic data generation and masking tools to ensure realistic and secure testing.

RTM Re-evaluation

Infosys proactively re-validates the RTM post the completion of system testing to ensure all the requirements are covered and passed. Infosys reports any discrepancies (if any).

Test Support to Consortium's Test and County UAT Teams

Infosys supports the Consortium's Test Team and the Consortium's County Validation Test efforts at the request of the Consortium.

Infosys understands the importance of user acceptance testing in the entire life cycle of design, development and implementation of CalSAWS systems. Our QA team manages the overall County UAT and Consortium's Test team effort for CalSAWS by utilizing industry standard methodologies and tools with customization according to the needs of CalSAWS project. Infosys UAT support and management activities are primarily be defined by 3 steps - planning, execution, and reporting. Infosys monitors the M&O Vendor activities to ensure readiness for UAT and compliance with UAT needs including technical support, environment, timely resolution of deficiencies and retesting. UAT is most effective when done by a dedicated team with specialized skills. UAT is performed by an independent team typically under the business (operations) group and reports to the business leadership. UAT is established as a managed service within the business organization and is engaged by project teams. During the course of a project, UAT teams and QA teams (ST, SIT) are managed independently of each other and have separate governance. Infosys understands that UAT is executed by county assigned testers located on-site as well as remotely at different county locations. Although on-site UAT execution is more convenient for communication and tracking of overall UAT activities, our approach recognizes the need for both on-site and remote UAT activities.

As part of support for Consortium's Test and County UAT Teams testing, we provide the following items (including but not limited to):

- Baseline Requirements Review and Analysis Process
- UAT Test Script Preparation and Review Process
- Unscripted Testing process – Ad hoc Testing
- UAT Environments planning and communication
- UAT test data management process
- UAT Information communication process
- Timelines and work plan for all phases of UAT
- Roles and Responsibilities of all stakeholders
- UAT Execution Process
- Incident management process
- UAT Entry and Exit Criteria
- Risk and Mitigation Plan
- UAT Progress Reporting Process

Deployment Plans Review

A deployment plan is a step-by-step guide on what needs to happen in the final stage of a project to get it into production. This plan needs to have every last little detail included no matter how minute. As per the Infosys previous similar type of assignment, Infosys review Deployment Plans that are linked into the overall service transition plan. The approach is to ensure an acceptable set of guidelines is in place for the release into production. The plan should define (including but not limited to):

- Scope and content of the release
- Risk assessment and risk profile for the release
- Counties affected by the release
- Delivery and deployment strategy
- Resources for the release and deployment

Release and build documentation – Infosys reviews procedures, templates and guidance to enable the release team to build an integrated release package efficiently and effectively. Procedures and documents are required for purchasing, distributing, installing, moving and controlling assets and components that are relevant to acquiring, building and testing a release.

Here are innovative ways to review the deployment plans of a SCR by focusing on improving reliability, transparency, and collaboration:

- AI-Powered Risk Assessment: Use AI to analyze deployment scripts and configurations for:
 - Potential failure points
 - Security misconfigurations
 - Resource bottlenecks
- Visual Deployment Flow Mapping:
 - Create flow diagrams showing:
 - Step-by-step deployment actions
 - Dependencies and sequencing
 - Rollback paths and contingency plans

Release Notes, Highlights and Training Materials Changes Review

Infosys reviews and provides recommendations for improvements and innovation to Change Management and Training activities, production readiness, green light/go, and no-go, activities.

As per the Infosys experience in similar engagement, after each release Infosys is validating changes materialized in that release is incorporated in the Training Materials for the respective sections. Also consistently tracking the health of the project and providing the observations and recommendations in the Release Notes and Highlights discussion. Every release with has some changes to CalSAWS systems. All these changes are captured in Release Notes and Highlights document. This document provides CalSAWS counties with the contents of the CalSAWS system current release and to explain the significant application changes that impact end-users and their use of the CalSAWS application. Some of these changes of those application changes that require an update to the Online User Manual.

The Infosys team analyzes this document and reports if any discrepancies are found. The key points that the team are analyzing include:

- Changes described in the Release Notes and Highlights document for a given project should be in sync with already approved SDLC deliverables document for the same project
- What's new in this release and its impact on CalWIN systems
- New changes impact on Programs
- Database changes and RT changes
- County Direct changes and its impact

Post Implementation Analysis and Review

Infosys reviews and provides recommendations for improvements and innovation to deployment and post-deployment activities.

Post Implementation Analysis Report is the last deliverable in the SCR SDLC lifecycle. This document contains all the issues, risks, effort/schedule deviations and variations observed in the entire SDLC CR project lifecycle. Team Infosys analyzes the overall health of the project for reviewing this document and provides the improvement suggestions and lessons learned for similar future projects. The team uses the following data in the process of analysis:

- Risks and Issues identified in the projects and their cause of occurrence and impact of the same
- All the Consortium, Counties and Infosys opened tickets in SR tool
- Budget and Schedule Variance and reason for the same
- Design Variance
- Lessons learned

Team Infosys knows that at times, our lack of programmatic insight may preclude us from being able to fully identify risks proactively. For instance, we may not have full visibility to the underlying factors affecting policy, or operational enhancements may not be fully implemented due to various technical or usability limitations in the systems. Infosys proactively lets the Consortium know of this kind of circumstance and suggests any possible mitigation plans. Infosys examines all such shortfalls against all governing regulations and policies and submits an analysis report documenting the deficiencies and recommending remediation wherever applicable. Infosys seeks the necessary input from the business and operations teams, as required, to perform this activity.

Last, Infosys' proven experience supporting public sector clients (in states such as CA, CT, DC, TX), included demonstrating flexibility in adapting our QA process and services to programmatic challenges. Our team employs the same approach for the CalSAWS Project allowing us to support any additional or future capabilities being developed and implemented in CalSAWS and BenefitsCal projects.

1.3.1.3 Timeline Enhancements

Infosys works with Consortium, M&O vendor and other key stakeholders to define a QA approach that enhances the overall impact of QA services on the full lifecycle timeline of software development by “pulling forward” the identification of risk areas. During this process Team Infosys is identifying, recording and escalating risks and issues as appropriate, and making recommendations for issue resolution/escalation tracking.

Infosys identifies any condition whose occurrence is uncertain, and which would result in an unfavorable outcome as a risk. The risk assessment and control processes at Infosys helps to identify the various risks, their impact, probability of occurrence and corresponding mitigation plan. These details are captured in a detailed Risk Management Plan and are tracked throughout the project lifecycle. The Risk Management Plan is continually modified to reflect the changing realities and circumstances of the project. The risks identified with high probability and high impact are reviewed in the regular status meeting and mitigation plans are modified to meet them.

In addition to the above, the Infosys QA team also receives input from the Infosys Delivery Risk Management (DRM) unit, and an independent Audit team focused on Software Quality Processes. These two teams are within Infosys internal organization and support ongoing key programs. The Infosys QA Team receives this input and support on a continuous basis from these two internal teams for risk management through the lifecycle of the project.

Team Infosys works with the Counties to identify, assess, prioritize, monitor and report to the Consortium those assessments and any recommendations for mitigation. Infosys analyzes, determines scope and evaluates each identified issue/problem to ascertain risk levels relative to the schedule, staffing and stakeholders, technical feasibility, functional viability, and cost.

As shown previously in Figure 1, Infosys takes a well-defined, structured and iterative approach for Risk Planning, Identification, Analysis, Evaluation, Assessment, Prioritization, Documentation, Tracking, Controlling, Communication, Escalation, Resolution, Closure, and Lesson Learned to proactively help all stakeholders resolve issues in a timely and efficient manner. Thereafter, Team Infosys works to facilitate risk closure and ensure there is no or minimal impact on the CalSAWS day-to-day operations. The Team Infosys approach to early risk management includes:

Infosys gathers and documents detailed lessons learned and root cause analysis observations during the entire Risk Management Process and reports the recommended improvements to the Consortium Team.

Our proactive QA approach to accelerate risk identification across the SDLC includes:

- Implement Shift-Left Testing Strategy – Embed QA early in the requirements and design phases to identify ambiguities, gaps, and potential risks before development begins. Requirement reviews, static analysis, and design walkthroughs are performed along with QA participation to uncover defects and risks early.
- Risk-Based Test Planning – Use historical defect data, domain knowledge, and stakeholder input to identify high-risk areas. QA team prioritize test coverage based on business impact, complexity, and change frequency, ensuring critical paths are tested first.
- Integrated QA in Agile Ceremonies – Ensure QA leads are active participants in backlog grooming, sprint planning, and daily stand-ups. This enables early identification of test dependencies, environmental needs, and potential blockers.

- Early Automation and CI/CD Integration – Automate unit, integration, and API tests early in the development cycle. Integrate QA into CI/CD pipelines to enable instant feedback on code quality and regression risks with every commit.
- Quality Gates and Early Metrics – Define quality gates at each SDLC phase (e.g., code review, build, test, release) with measurable criteria. Track early metrics like defect leakage rate, test case effectiveness, and requirement volatility to adjust QA focus dynamically.

1.3.1.4 Examples

During our previous engagement within the CalSAWS Consortium's CalWIN Project, we reviewed the quality of the systems, deliverables, work products, and Maintenance and Operation (M&O) services to monitor and evaluate compliance and timely performance of the M&O Vendor. As a routine aspect of delivering QA services, we also collaborated with the collective operations staff and stakeholders to provide assessments against KPIs, risk assessments and enhancement suggestions. Some specific examples are noted below:

- We identified situations, occurrences, and deficiencies as early as possible in SDLC where schedules and standards were not meeting established thresholds. Infosys reported those problems and deficiencies as well as proposed solutions to the CalWIN-CalSAWS Project Executive Director on a weekly and monthly basis. Thereafter, we monitored the corrective activities in accordance with the directions and time frames provided by the CalWIN-CalSAWS Project Executive Director.
- One of the standout qualities demonstrated by Infosys was our ability to adapt to evolving project requirements and navigate challenges effectively across all phases of project SDLC and specially “pulling forward” the identification of risk areas. Whether responding to late legislative and regulatory related requirement changes, COVID-19 Emergency or Public Health Emergency (PHE) changes, Disaster Benefit Issuances changes (due to CA Wildfires, Public Safety Power Shutoffs (PSPS), & Federal shutdown), County specific GA/GR specific changes, shifting timelines, or any unforeseen technical issues, Infosys identified the risks in advance and remained flexible and solution oriented. Some examples given below:
 - Mitigating COVID-19 Public Health Emergency (PHE) impact for Medi-Cal: With Medi-Cal renewals being paused during the PHE, cases with past due renewal dates needed updates before PHE lift or migration. Infosys proactively identified the risks in advance in several PHE areas. For instance, how discontinuances or negative actions and cases with past due renewal dates, can be handled during PHE and during PHE unwinding period. These proactive measures also reduced counties' backlogs/manual efforts.
 - CalFresh emergency monthly allotments due to Covid – 19: Due to Infosys collaborative effort to identify risks early, we ensured that:
 - There was an implementation of common CalFresh payment codes.
 - Reduced the possibility of CalFresh over issuance/under issuance payments.
 - Disaster Benefit Issuances: During numerous public disaster events including the CA Wildfires, Public Safety Power Shutoffs (PSPS), Infosys raised an early risk that there was be a separate setup in CalWIN for handling these changes. However, in CalSAWS, the setup may be different. Infosys recommended alignment between the CalWIN counties and the CalSAWS counties in payment aspects like different benefit type codes, transaction types, payment type codes, etc.
 - General Availability (GA) / General Release (GR) Programs Business Functions: The three SAWS systems have different approaches to support the Counties GA/GR efforts. Infosys raised an early risk during the CalSAWS migration phase that there may be post

migration data issues in common functionalities (such as data collection, fiscal, employment services, interfaces, issuances, batch EBT, etc.). Due to this Infosys identification and subsequent collaboration, the collective team ensured minimal challenges in data mapping of the existing data structures of GA/GR into CalSAWS data structures. This also assisted in re-platforming the CalWIN GR eligibility within the CalSAWS business rules engine.

- Infosys coordinated with CalWIN-CalSAWS product owners, Counties, Consortium and M&O Vendor for system estimates and data requests that come from a variety of communications to ensure no communication issues or timeline delays were encountered. These data requests included:
 - SAWS Communication Information Request for Research and Analysis (SCIRFRA)
 - SAWS Cost Estimation Request for Research and Analysis (SCERFRA)
 - SAWS Information Request for Research and Analysis (SIRFRA)
 - SAWS Advocates Request for Research and Analysis (SARRA)
- Reviewed and performed impact analysis of CalWIN project tools, software, hardware and ensured:
 - Timely upgrades/versions were properly managed by M&O vendor
 - There were no 'out of support' product versions in production
- Early identification of potential security risk areas and suggested potential solutions. Assisted M&O Vendor to pass the SOC audits.

As noted in the numerous examples above, Team Infosys personnel provide the required thought leadership needed to identify and pull risks forward so they may be resolved proactively and thereby preclude downstream issues.

1.3.2 Understanding and Approach 7

1.3.2.1 Understanding

Infosys understands the Consortium has identified key vision elements associated with User Centered Design and the User Experience adoption and evolution activities such as:

- Expanding and further refining User Centered Design (UCD) and the User Experience (UX) within the BenefitsCal software development process.
- Support the adoption and evolution of User Centered Design and the User Experience within CalSAWS.

Infosys ensures these key vision items are addressed by our QA team as well as the M&O vendor. As per Consortium's expectations for addressing the key vision items, Infosys follows the two-phased approach in our QA activities:

- Understand and adhere to Consortium-established project processes
- Fully integrate our team into the collaborative CalSAWS ecosystem

After reestablishing a current and thorough understanding of the CalSAWS environment, Infosys, as the QA vendor, adds value by analyzing and making realistic and practical recommendations for improvements in all aspects of the CalSAWS Project SDLC.

In this regard, Team Infosys works with the Consortium, M&O vendor and other key stakeholders during the transition and initial phases of our QA contract and provides the approach, methodology, and innovative thinking to the Consortium with roadmaps on how to achieve the Consortium's vision for the future which includes the user as a central focus. Infosys approach and key factors in our QA approach for supporting the User Centered Design and the User Experience adoption and evolution within CalSAWS are outlined below.

1.3.2.2 Approach

Infosys recognizes that BenefitsCal has been designed, developed, and enhanced following a User Centered Design (UCD) approach. The system is founded on keeping the human experience at the center of system design, and going forward, this approach continues in BenefitsCal. Infosys efforts ensure that our QA approach further supports the adoption and evolution of User Centered Design and the User Experience within CalSAWS. Infosys involvement in all the key CalSAWS UCD activities (such as: UCD Discovery Research, Ad hoc and Monthly UCD Meetings, Enhancement-specific Focus Group Sessions) and provide recommendations to Consortium for any improvements/enhancements. As part of our approach, our QA staff actively participate in four stages of UCD (Discover, Define, Build and Deliver) and suggest industry best practices for UCD adoption and evolution in CalSAWS.

During the transition and initial phases of delivering QA services, the ten key factors used within our QA approach as we work with the Consortium, M&O vendor and other key stakeholders to enhance the deployed solution are:

- **Early Collaboration with UX and Design Teams** – QA is embedded from the ideation and design phase, participating in design reviews, wireframe validations, and usability walkthroughs. This ensures that user personas, journeys, and accessibility requirements are understood and validated early.
- **Documentation of User Feedback** – Maintaining a centralized repository for user feedback and testing results ensures informed design decisions. Infosys emphasize knowledge management and documentation as part of their continuous service improvement approach.
- **Usability Testing Integration** – QA incorporates usability testing as a core activity, validating not just functionality but also ease of use, intuitiveness, and satisfaction. Real users or proxy personas are involved in scenario-based testing to simulate actual usage patterns.
- **Continuous Feedback Loops** – QA facilitates feedback collection mechanisms (e.g., surveys, heatmaps, session recordings) during testing phases. These insights are fed back into design and development to iteratively improve UX.

This can be achieved by Usability testing (as explained above) and A/B Testing (Comparing different design variations to determine which one better meets user needs. This aligns with Infosys' focus on leveraging analytics for insight-driven decisions).

- **User-Centric Testing Framework** – Our QA approach that emphasizes user-centric testing is essential for enhancing UCD. This involves creating a testing framework that prioritizes user needs and behaviors. Key components include:
 - **User Personas:** Developing detailed user personas based on research to guide testing scenarios. These personas help the QA team simulate real-world user interactions and ensure the software meets diverse user needs.
 - For example, Infosys employs persona-based approaches to ensure people-centric transformation, as seen in their Fast Track Expansion methodology. This helps validate contextual relevance and emotional resonance of the experience.
 - **User Journey Mapping:** Creating user journey maps to identify critical touchpoints and potential pain points in the user experience. This aligns with Infosys' focus on user personas and journeys to drive outcome-based approaches.
 - **Heuristic Evaluation:** QA testers assess the application against established usability principles to identify issues early. Infosys employs heuristic evaluations to refine user experience.

- **Cross Device and Cross Browser Testing** – It is a crucial part of QA ensuring that a software application delivers a consistent and high-quality user experience across various platforms, devices, and browsers.
- **Performance and Responsiveness Testing** – QA validates load times, responsiveness, and fluidity of interactions across devices and platforms. These factors are critical to perceived UX and user retention.
- **UX Metrics and KPIs (Key Performance Indicator)**– QA tracks and reports on UX-related metrics such as task success rate, error rate, time on task, and satisfaction scores. These metrics help quantify the impact of design decisions and guide future enhancements. For example, Infosys employs tools like the Digital Experience Index to measure user experience for different personas, ensuring that both end-users and service agents have optimized interactions.
- **Agile and DevSecOps Alignment** – QA works in tandem with Agile teams to validate UX in incremental releases, enabling faster feedback and course correction. In DevSecOps environments, automated UX validations are integrated into CI/CD pipelines.
- **Post-Launch Monitoring** – QA team monitors user interactions and feedback post-launch to identify areas for improvement. Infosys uses analytics and feedback mechanisms to inform future updates and enhancements.

By employing these QA approaches, activities, and techniques, Infosys can effectively enhance UCD and UX within the CalSAWS software development lifecycle, ensuring that user needs are prioritized and met throughout the lifecycle of the application.

Overall, Infosys has acquired and leveraged an excellent UCD and UX knowledge/experience base and we bring this expertise into CalSAWS for its UCD/UX adoption and evolution:

- Experienced in understanding users' goals, behaviors, pain points, and support required and the ability to elicit this content during interviews, surveys, studies.
- Worked in cross-functional collaboration with designers, developers, QA, product managers, and stakeholders.
- Used rapid prototyping and usability testing to improve UX through continuous refinement based on feedback.
- Propagated knowledge about UCD in organizational culture and leadership support groups.
- Promoted UCD continuous learning and UX Maturity.

Our QA approach for the CalSAWS Project includes working with our assigned counterparts to employ these strategies as we improve the fielded solutions.

1.3.2.3 Examples

Team Infosys provides the two following examples of how we supported the advancement of UCD and UX methodologies for our customers.

Example 1: [REDACTED]

In support of our customer, [REDACTED], Team Infosys applied a comprehensive UCD and UX methodology to address key UX challenges for this leading publisher and their customer-facing websites such as [REDACTED]. The following challenges were reported:

- Browser inconsistencies
- Screen responsiveness issues
- Accessibility gaps

Our QA-led initiatives helped address these challenges and elevate the overall user experience:

- Persona-based QA testing: QA teams simulated real-world user behaviors—new visitors, returning users, and subscribers—to validate inclusive design decisions and ensure the experience was tailored to diverse user needs.
- Tool-driven UX validation: QA leveraged Figma, Browser Dev Tools, AccelQ, and Browser Stack to verify design fidelity across browsers and devices, ensuring consistent and responsive interfaces.
- Accessibility assurance: QA conducted thorough accessibility testing using WAVE, AXE, and Headings Map to ensure WCAG 2.1 compliance. These efforts were supported by workshops and leadership sessions to embed accessibility into the development lifecycle.
- Continuous Testing & Automation: QA implemented Jenkins-based pipelines for automated weekly regression and smoke testing. This enabled early defect detection, reduced manual effort, and accelerated feedback loops—ensuring faster delivery of high-quality user experiences.

Through proactive QA involvement, the client achieved:

- A consistent and seamless user experience across platforms.
- Significant improvements in Core Web Vitals such as Cumulative Layout Shift (CLS) and Largest Contentful Paint (LCP)
- Enhanced Search Engine Optimization (SEO), resulting in higher search rankings, lower bounce rates, and improved customer satisfaction

Example 2: Automobile Manufacturer

For one of our Automobile manufacturer clients, Infosys was involved in UCD/UX implementation of their Incentives Management System. During the requirements gathering phase, Infosys gained insight and gathered clear business drivers impacting UI, technology drivers impacting UI, user profiles, user tasks, branding requirements and aesthetic sensibilities. As a result, we clearly understood the Incentives Management System clients pain points such as:

- Interaction design issues that cause unpredictability throughout the application and create user frustration. Interactional consistency and industry standards were not followed in the design.
- Search is not structured properly to be used efficiently.
- Help is not properly positioned and structured.
- Unwanted scrolling, toggling and expand/collapse.
- Improper and unclear error handling.
- Visual affordance is not evident enough and the color pallet is confusing.
- Content is not organized and structured.

Subsequently, Infosys was involved in various UCD/UX activities (Research & Discovery, User Research & Analysis, User Profiling, Conceptual Design Phase, Navigation Models, Wireframes, Visual Design Phase, Style Specifications / Guide, Forms elements, and UI assets, etc.). Thereafter, we implemented and developed the following solutions to the pain points:

- Contextual help includes more info icons and help bubbles.
- Simple search with progressive filtering and advanced search.
- Dynamic error handling with runtime valid data confirmation and invalid data highlighted.

- Structured content hierarchy by effective use of wizards with well-defined entry points and multi-tasking views.
- Simple and clean minimalist visual design with effective use of color. Clear alert and visual status design.

1.3.3 Understanding and Approach 8

1.3.3.1 Understanding

To deliver elements within the Consortium's key visions, Team Infosys understands the need to examine and propose enhancements to all aspects of the SDLC. These proposed enhancements encompass elements directly within the QA domain but also include envisioned enhancements to the application change processes / software development processes as well as within the application / architecture evolution and innovation areas. With respect to improvements in the application change process, support for the evolution and advancement of Automated Regression Testing within CalSAWS is a recognized priority. In support of this enhancement, Team Infosys works with the M&O vendor and other Consortium stakeholders to deliver solutions in an accelerated manner.

To drive innovative solutions for the evolution and advancement of Automated Regression Testing, especially in Agile and DevSecOps environments, we envision collaboratively focusing on intelligence, scalability, maintainability, and integration. Some of these solutions are envisioned for implementation via the M&O vendor via enhanced system testing. Other solution elements are accomplished via our independent testing after discussions and agreements with the Consortium and other key vendors and stakeholders.

1.3.3.2 Approach and Key Factors for Automated Regression Testing

Team Infosys ensures that our QA approach supports the evolution and advancement of Automated Regression Testing within CalSAWS by employing 12 key factors as we recognize these as essential for the very near-term evolution and advancement of Automated Regression Testing within the CalSAWS ecosystem. Longer term, based on our experience with other customers, we envision Next-Gen Artificial Intelligence (AI) Quality Engineering (QE) accelerating further automation, particularly in regression testing.

As such, after we describe the 12 key factors and how we use them within our approach, we provide a discussion on Next-Gen AI-powered QE and our approach to deploying these capabilities to enhance and accelerate Automated Regression Testing. This includes describing Infosys's Next-Gen AI-Powered QE framework. Our framework is an Intelligent Automated Regression Testing Framework for the CalSAWS transformation that is suggested and recommended by Team Infosys.

1.3.3.2.1 Key QA Factors Supporting CalSAWS Automated Regression Testing

By prioritizing impact, usability, and long-term benefits, these factors ensure scalable, efficient, and reliable testing practices that align with the modern development methodologies. Team Infosys adopts these best practices and works with the M&O vendor to review / understand / enhance the M&O vendor testing processes as we collectively ensure that the best testing plus automated regression testing practices are followed.

The 12 key factors included within our approach to driving the evolution and advancement of automated regression testing are as follows:

- **CI/CD Integration for Continuous Validation**

Integrating automated regression testing into Continuous Integration/Continuous Deployment (CI/CD) pipelines ensures that tests are triggered with every code

commitment. This enables early defect detection, accelerates feedback loops, and supports faster, more reliable releases. It transforms regression testing from a periodic activity into a continuous quality gate.

- **AI/ML-Driven Test Optimization**

Leveraging AI and machine learning enhances regression testing by identifying unnecessary tests, predicting failure-prone areas, and optimizing the test coverage. These insights help teams refine their test suites and focus on areas with the highest business impact.

- **Modular and Scalable Test Architecture**

A well-structured, modular test framework allows for easy maintenance and scalability. Reusable components and abstraction layers help teams quickly adapt to changes in application logic, UI, or APIs without rewriting entire test suites.

- **Dynamic Test Case Selection and Risk-Based Testing**

Using risk-based prioritization and intelligently selecting relevant regression tests based on recent code changes. This reduces execution time, focuses efforts on high-risk areas, and ensures optimal resource utilization without compromising coverage.

- **Robust Test Data Management**

Effective test data strategies such as synthetic data generation, data masking, and environment-specific datasets ensure consistency and reliability in test execution. Proper data management improves the accuracy of regression results.

- **Maintenance and Optimization Strategy for Test Suites**

Regularly reviewing and refactoring test cases ensures the regression suite remains lean, relevant, and effective. Removing obsolete tests and updating scripts improves execution speed and accuracy. Establish a test case review cadence to retire obsolete tests, update scripts for UI changes, and refactor for performance. Monitor flaky tests and false positives to maintain trust in automation results.

- **Shift-Left Testing Practices**

Incorporating testing early in the development lifecycle (unit and integration levels) reduces the number of defects that reach regression stages, improving overall test efficiency. Automated tests run on every code commit, catching issues before they reach QA or production.

- **Cross-Platform and Cross-Browser Coverage**

Ensuring regression tests run across multiple platforms, browsers, and devices guarantee a consistent user experience. This is especially critical in mobile-first and responsive environments, where accessibility and usability vary widely.

- **Version Control and Traceability**

Maintaining version control of test scripts and mapping them to specific application versions or requirements enhances traceability. It supports auditability, impact analysis, and ensures that regression tests remain relevant and aligned with evolving business needs.

- **Test Data Management**

Use synthetic and masked production-like test data to ensure consistency and compliance across environments.

- **Comprehensive Reporting and Analytics**

Advanced dashboards and analytics provide visibility into test execution trends, defect patterns, and coverage metrics. These insights empower QA leaders to make data-driven decisions, improve test effectiveness, and communicate value to stakeholders.

• **Collaboration and Governance**

Establishing clear governance models, coding standards, and cross-functional collaboration ensures alignment between QA, development, and business teams to define KPIs like test coverage, pass rate, defect leakage, and automation ROI helps leadership make informed decisions.

By applying these 12 factors within our Automated Regression Testing approach followed by using our Next-Gen AI-Powered QE as discussed below, Team Infosys expects significant advancements within the regression testing domain. To ensure full compliance with emerging AI principles, Team Infosys relies on Responsible AI (such as Ethical Considerations, Regulatory Compliance, Trust and Adoption, Risk Mitigation, Human touch, etc.). This ensures that AI technologies are developed and used in ways that are fair, reliable, safe, inclusive, transparent, and accountable. This is also applicable for our Independent testing approach as test accelerator for efficiency.

1.3.3.2.2 Next-Gen AI-Powered QE: Intelligent Automated Regression Testing Framework for CalSAWS Transformation

We believe there are significant opportunities for the advancement of Automated Regression Testing within CalSAWS. These advancements reduce the cycle time to release features and dramatically increase speed to market by applying AI-enhanced QA shift-left principles and intelligent automation frameworks. This transformation vision is based on different aspects and is distributed across the three themes of: **Better, Faster** and **Stronger** as noted below:

- Implementing Generative AI in Quality Engineering (Better)
- Test Automation – Transforming from Regression Focus to Extreme Automation (Faster)
- Centralized AI Market Place for Automated Testing Excellence (Stronger)

These three themes are discussed in further detail below.

Infosys performs an AI assessment using the Assessment framework which also includes a proof-of-concept. Then based on the outcome, Infosys develops a road map for implementing the same.

Our approach includes knowledge sharing across the organization to align the collective team on the evolving solution.

Implementing Generative AI in Quality Engineering (Better)

Enhance conventional testing methods, accelerate automation tasks, and optimize QE processes across lifecycles. Table 11 below provides some of the methods Team Infosys envisions deploying to assist the CalSAWS Project include:

Table 11. Enhancement Methods Envisioned by Team Infosys

AI Enabled QA Activity	Approach
AI powered Automation Testcase Generation	Use LLM's to convert user stories into test cases creation, including positive and negative testcases. Tools: GitHub copilot
Smart test case Prioritizations	Apply ML models to historical test execution data (from ALM or Azure DevOps) to Predict high-risk areas and prioritize test cases based on defect density, code churn, or business impact

Self-healing test Automation	Develop AI-powered self-healing tools [ex: LLM based tools] which help in identifying the defects, test case creation, execution and report results which reduce manual effort and improve test reliability.
Predictive Defect Analytics & Intelligent Triage	Use AI to analyze JIRA defect history and predict: • Likely defect-prone modules. • Optimal assignees based on past resolution patterns. • Severity and priority classification
Traceability & Coverage Intelligence	Use Gen AI to create an intelligent mapping between requirements, testcases, and code changes.
Natural language interfaces	Use Generative AI to automatically create and maintain comprehensive documentation, generation of reports by using natural language via AI chatbots.

Tools that can be used are - GitHub Copilot, Microsoft Auto Gen, Swagger AI, Infosys IQE Platform, Selenium, Playwright, and JIRA.

Test Automation – Transforming from Regression Focus to Extreme Automation (Faster)

AI powered, continuous testing (AI in DevOps) is a major, evolving shift in DevOps. It helps address the following three development enhancements:

- Real-time validation of code changes.
- Seamless Integration with CI/CD pipelines.
- Faster feedback loops for developers.

These three development enhancements are depicted in Figure 5 below.

Further, we envision our AI powered framework to play a transformative role in DevSecOps by enhancing automation, improving security, and enabling faster, more reliable software delivery. AI contributes across the DevSecOps lifecycle and helps in Threat Detection & Prevention, Automated Security Testing, CI/CD Pipeline Optimization, Compliance & Policy Enforcement, Intelligent Incident Response, and Continuous Learning & Feedback.

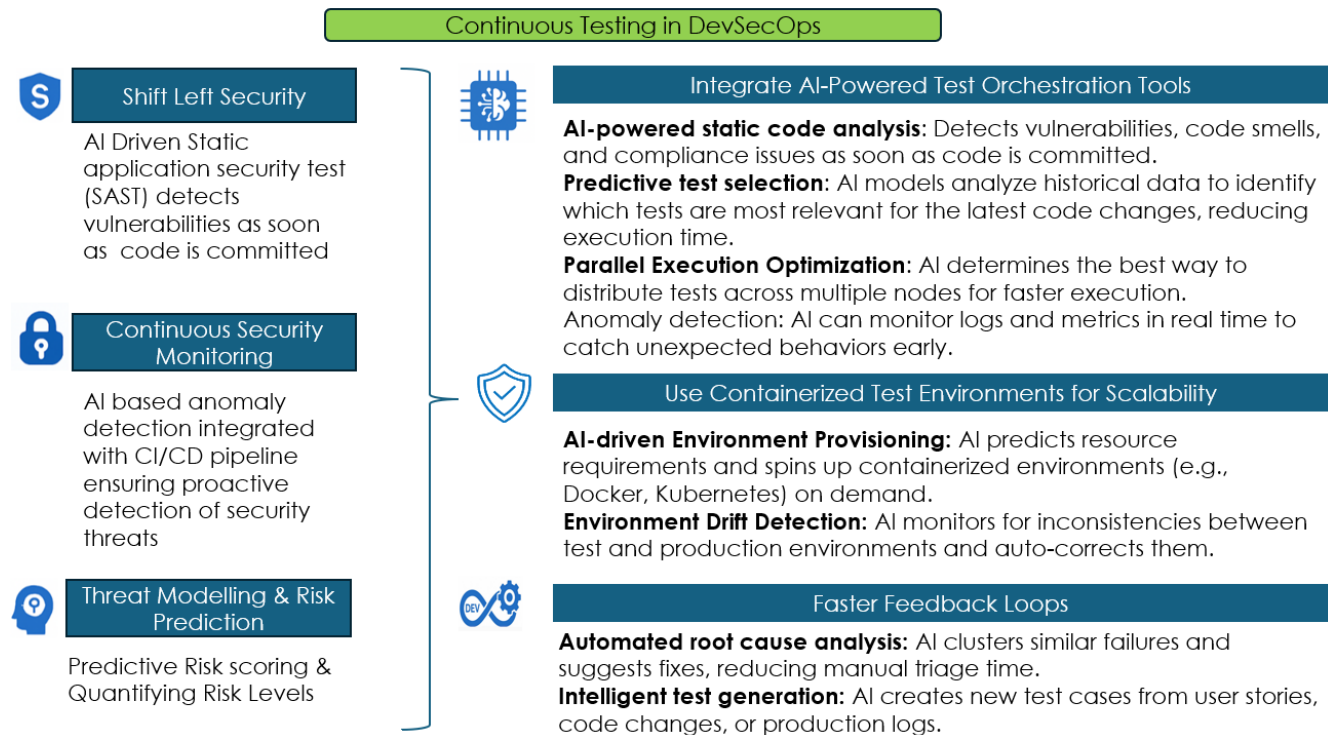


Figure 5. AI Enhancements Accelerate Development

Another aspect includes Extreme Shift-Left Automation. A core component of this approach embeds functional and non-functional testing earlier into the SDLC. Infosys adopts several methods to introduce Shift Left. Team Infosys adopts the Shift-Left approach during project execution in which our QA Independent testing team is involved right from requirement gathering stage for verification of requirements to enable early validation.

Tools that can be used are – AWS Code Guru (Code quality analysis and performance profiling), Datadog (Monitoring, anomaly detection, and test observability), Dynatrace (Predictive monitoring and automated root cause analysis), Microsoft Defender for Cloud, Darktrace, and Blackduck.

Centralized AI Market Place for Automated Testing Excellence (Stronger)

To create a stronger QA process, we suggest building a new intelligent platform that delivers plug-and-play capabilities for test generation, data provisioning, and analytics. The platform uses self-learning models that evolve with usage and feedback, enabling accelerated QE workflows with minimal manual intervention. This approach allows our teams to easily discover, evaluate, and deploy AI testing tools while fostering continuous innovation across our entire development lifecycle.

Key Features:

Tool Discovery & Comparison:

Browse a curated catalog of AI tools tailored for QE. Compare features, pricing, performance, and compatibility.

Community Ratings & Feedback:

User reviews and ratings to guide tool selection. Feedback loops to improve tool recommendations and model performance.

Integration APIs:

Seamless integration with DevOps pipelines (CI/CD). SDKs and connectors for popular platforms (e.g., Jenkins, GitHub Actions, Azure DevOps).

Analytics & Insights:

Real-time dashboards for test coverage, defect prediction, and performance metrics. AI-powered insights to optimize test strategies.

Self-Learning Models:

- Models that adapt based on historical test data and user behavior.
- Continuous improvement through reinforcement learning and feedback.

Reduced Manual Oversight:

- Automated test case generation and maintenance.
- Intelligent data provisioning and environment setup.

Workforce: From traditional to Modernized Workforce

These new behaviors and skills require a workforce transformation from testers who are focused on Automation testing to AI engineers with enhanced technical capabilities, deep domain knowledge, and strategic thinking skills.

Figure 6 below illustrates a systematic, step-by-step approach to transforming the existing workforce from traditional automation testers into AI-enabled quality engineers.

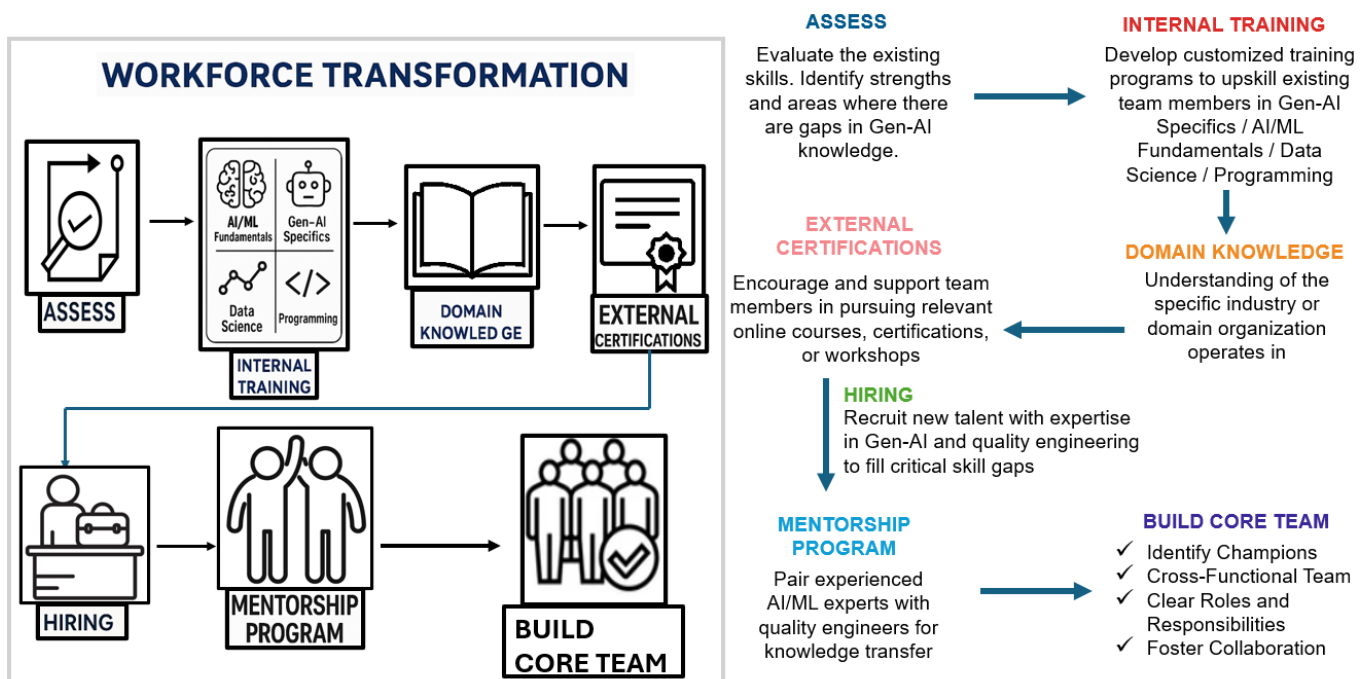


Figure 6. Proposed Workforce Transformation Into AI-Enabled Quality Engineers

1.3.3.3 Examples

During our previous support to the Consortium's CalWIN Project, Team Infosys provided Automated Regression Testing recommendations to improve the M&O Vendor's Regression Suite. The M&O Vendor implemented numerous functional changes along with several architectural and infrastructure changes in every release. The releases resulted in unforeseen issues in the production environment. To resolve, Team Infosys recommended a comprehensive revision to the regression test suite to cover several downstream subsystems. Also, we recommended considering certification of older as well as newer versions of a variety of browsers via automation testing. These tests when performed ruled out any significant impact on the baseline system transaction and batch performance due to software and hardware infrastructure changes like the Oracle Database, WebLogic version upgrades as well as several subsystems being migrated from On-prem to AWS. Overall, the implemented recommendations resulted in a significant reduction in post-production regression defects.

Within other QA engagements, Team Infosys has introduced numerous Automated Regression Testing enhancements as note below:

- **Test Automation Strategy and Governance** – A clear approach ensures alignment with business goals and technical feasibility.
- **Robust Test Frameworks** – A scalable and modular framework accelerates test development and reduces maintenance.
- **Early and Continuous Integration** – Running regression tests early and often helps catch issues before they escalate.
- **Test Data Management** – Reliable and relevant test data ensures accurate regression results.
- **Scalability and Parallel Execution** – As test suites grow, execution time must remain manageable.
- **Maintenance and Refactoring Discipline** – Outdated or flaky tests reduce trust and effectiveness.
- **Comprehensive Reporting and Analytics** – Actionable insights drive continuous improvement.
- **Skill Development and Collaboration** – Skilled teams build better automation and adapt to evolving needs.
- **Risk-Based Regression Selection** – Not all tests need to run every time focus on high-impact areas.

Overall, we applied a mature QA approach to automated regression testing leads to: Faster release cycles, Higher confidence in code changes, Reduced manual effort and Improved product stability and user satisfaction.

Further, given an example from usage of the AI tool:

- For Implementing Generative AI in Quality Engineering (Better): Tools that were used – GitHub, Copilot, Microsoft Auto Gen, Swagger AI, and Infosys IQE Platform.
- Test Automation: Transforming from Regression Focus to Extreme Automation (Faster): Tools that were used – AWS Code Guru (Code quality analysis and performance profiling), Datadog (Monitoring, anomaly detection, and test observability), Dynatrace (Predictive monitoring and automated root cause analysis), Microsoft Defender for Cloud, and Darktrace.

1.3.4 Understanding and Approach 9

1.3.4.1 Understanding

Within the Consortium's key vision element regarding Application Change Process / Software Development Process we also understand and support improvements using the Release When Ready (RWR) approach along with moving to DevSecOps while increasing the frequency of smaller updates while shortening the systems development life cycle and providing continuous delivery with high CalSAWS Software quality. Team Infosys has direct experience in delivering these capabilities for other customers and leverages this experience to assist the current M&O Vendor with suggestions regarding best practices as elaborated herein. As noted previously, we recognize and follow the two-phased approach (understand the current system/processes and suggest improvement recommendations) stipulated by the Consortium. Within the approach below, we provide a few innovative recommendations for improvements.

To support the evolution of the "Release When Ready" approach within a DevOps and DevSecOps framework, innovative solutions should focus on automation, confidence, flexibility, security and governance. This approach allows teams to release software as soon as it is stable and validated, rather than waiting for fixed schedules.

1.3.4.2 Approach and Key Factors

Team Infosys ensures that our QA approach supports the evolution and advancement of DevSecOps within CalSAWS. We validate and confirm that the system modifications adhere to the Consortium's evolving DevSecOps practices. Our QA approach includes using the following 9 key factors as follows:

- **Shift-Left Security Testing.** QA integrates security validation early in the SDLC, starting from the requirements and design phases. This includes conducting static code analysis, threat modeling, and secure design reviews to identify vulnerabilities before development begins.
- **Security-Driven Test Automation.** Extend automated test suites to include security test cases, such as input validation, authentication, authorization, and data protection.
- **CI/CD Pipeline Security Integration.** Embed security checks into CI/CD pipelines to ensure continuous security validation with every build and deployment. Automate dependency scanning, container security checks, and infrastructure-as-code validations to catch risks early.
- **Secure Coding Practices and QA Collaboration.** Our approach here includes a seamless integration where QA works closely with the developers to promote secure coding standards, ensuring that test cases validate against common security flaws (e.g., SQL injection, XSS, CSRF). As part of this activity, we ensure code reviews with a security lens are conducted, supported by QA-led checklists and guidelines.
- **Dynamic and Runtime Security Testing.** Our QA team performs dynamic application security testing (DAST) during functional and performance testing phases. Validate runtime behaviors such as session management, error handling, and data encryption under real-world conditions.
- **Risk-Based Test Prioritization.** QA uses risk profiling and threat intelligence to prioritize test coverage for high-risk components and services. This includes a focus on business-critical workflows, exposed APIs, and third-party integrations that pose higher security risks.
- **Continuous Monitoring and Feedback.** QA supports real-time monitoring of security metrics and feeding insights back into development and operations. As part of this activity the QA team collaborates with SecOps teams to analyze security logs, alerts, and incident reports for proactive test case updates.

- **Compliance and Governance Validation.** QA ensures the maintenance of audit trails and traceability matrices for all security-related validations.
- **Security Awareness and Enablement.** The Team Infosys QA team is trained in DevSecOps principles, security testing tools, and secure development lifecycle practices. This is used to promote a security-first culture across QA and development teams through workshops, playbooks, and collaborative threat modeling sessions.

1.3.4.3 Examples

Infosys has implemented DevSecOps successfully across multiple industries, showcasing our ability to integrate security seamlessly into Agile and DevOps practices. Three notable examples of Infosys' DevSecOps implementations:

Example 1: For a Leading Telecom Provider, Infosys delivered a centralized DevSecOps solution. Going into the project we recognized three challenges: Fragmented DevSecOps tools and manual processes, Slow release cycles and inconsistent quality, and Security checks were limited and not automated.

Team Infosys implemented a solution that provided: a centralized DevSecOps platform using Infosys DevSecOps Engine, Shift-left security with automated SAST and SCA in CI pipelines, Cloud-first approach using Google Cloud Platform and Data-driven insights for real-time visibility into performance and security.

From the customer's perspective the positive outcomes included: Faster time-to-market, Improved customer acquisition and retention, and Enhanced security and governance across applications.

Example 2: A US-based health insurance company needed to transform their DevSecOps capability delivery and ensure faster adoption. During this engagement, the client noted the following DevSecOps requirements along with corresponding goals/metrics:

- Increase DevSecOps capability delivery velocity (20% increase in sprint velocity)
- Drive adoption of delivered capabilities (Broader and faster adoption of new Capabilities)
- Reduce operations costs (>10% operations cost savings YoY – Year-over-Year)
- Release Mean Time to Resolve (MTTR) of incidents and service requests (10% reduction YoY)
- Leverage industry leading practices and bring innovative ideas in context of health insurance (Continuously enhance the backlog)

Infosys identified specific interventions to address the key opportunity areas using our expertise in DevSecOps. Infosys incorporated all the requirements into our DevSecOps solution to deliver the key objectives of this health insurance client as shown Figure 7 below. Our key methods and corresponding detailed level activities are depicted in the first two columns while the third column depicts the results of our efforts.

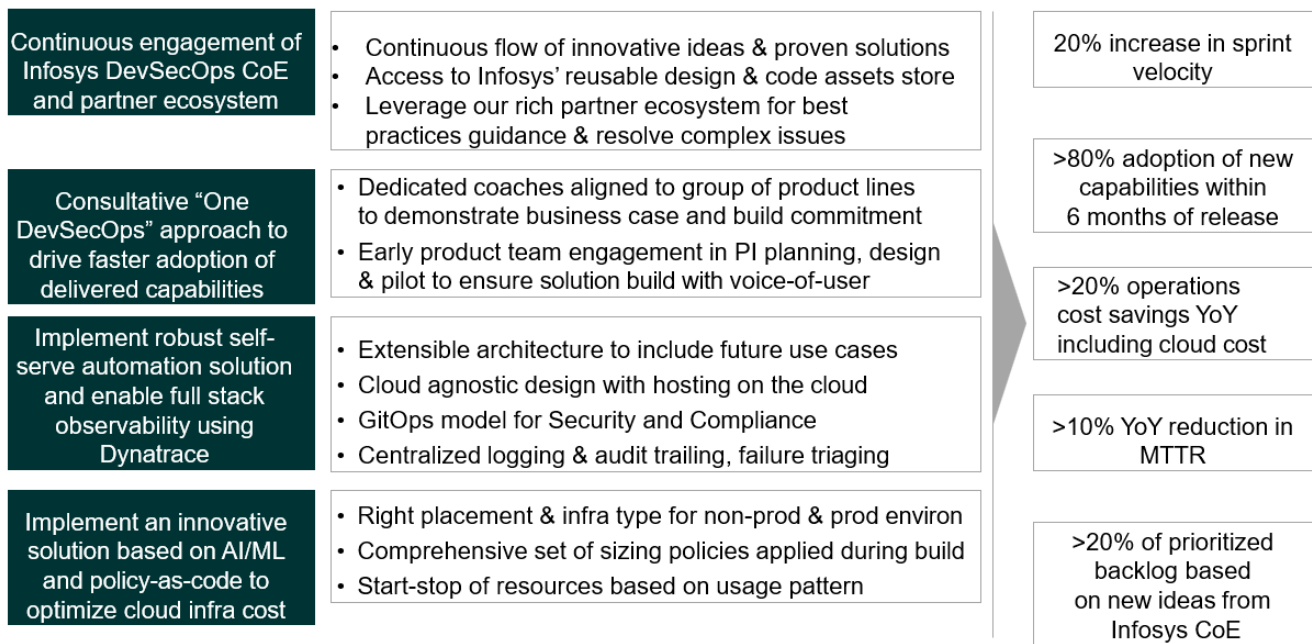


Figure 7. Team Infosys Methods, Activities and Results

Example 3: For a Global Networking Giant, Infosys provided an integrated Infrastructure Operations (InfraOps) with DevSecOps. This customer desired zero downtime and faster releases.

The solution provided by Infosys combined InfraOps and DevSecOps automation as a way to enable continuous delivery with built-in quality and security. At project completion, the customer was able to realize zero downtime during releases and an accelerated time-to-market.

As demonstrated within the examples above, Team Infosys has the requisite staff with the skill sets and process improvement discipline to deliver exceptional support in the evolution and advancement of DevSecOps for CalSAWS project.

1.4 Sub-Section 5.2.3.4 – Approach to Independent Test

1.4.1 Understanding and Approach 10

1.4.1.1 Understanding of Independent Testing

As a prior QA Services provider for CalWIN, Team Infosys has direct experience supporting the required independent testing that goes beyond the defined M&O testing and UAT testing completed as part of the SDLC delivery process. As requested, our description addresses the establishment of an initial set of independent test cases. However, based on the procurement library information within the RFP release, we understand there is an existing repository of independent test materials. Accordingly, during execution, our team leverages these existing testing assets as coordinated with the Consortium.

Below section details our Infosys approach at CalSAWS to establish initial set of independent test cases and the requisite test data even though we envisage the usage of existing independent test cases to reduce the effort spent in creating initial set of independent test cases.

1.4.1.2 Approach

Our approach to independent testing starts during the M&O phase after the SCR is approved. At this time, our QA team initiates the creation of test assets needed to implement our assigned

Independent Testing activities. This activity is continuously improved in future releases based on the planned SCRs.

Figure 8 below illustrates our structured approach and operational method to achieve this effectively:

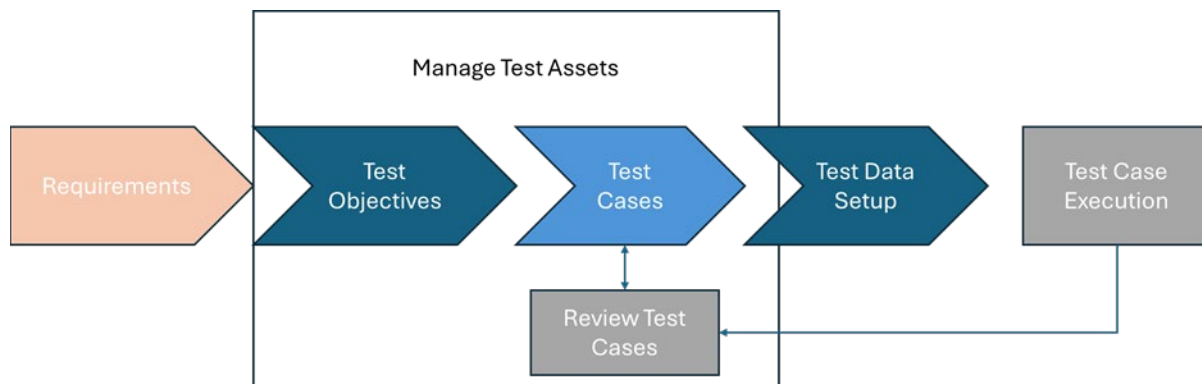


Figure 8. Approach for Independent Test Asset Creation

Our Independent Testing approach follows the 7 activities noted below.

1. Understand Requirements and Functional Specifications

The objective of this activity is to gain clarity on what the system is expected to do. This is accomplished by reviewing the business requirements, functional requirements, user stories, and acceptance criteria that are part of the SCR. During this time our independent testing team reviews the requirements for completeness, understands the scope of the change, and impacts the current application.

During this phase, the team also identifies functional and non-functional aspects which helps in understanding the requirements and assists in consultations with business stakeholders, the Counties, and stakeholders to clarify any ambiguities in requirements. Received clarifications also result in updates to the requisite system documents.

To ensure that the application under test is properly tested, we ensure that we create Requirement Traceability Matrix (RTM) using the Test management tool being used at CalSAWS (JIRA). This ensures that the test coverage is complete and accurate for all the requirements, and no requirement is missed in test subsequent testing phases.

2. Define Test Objectives and Scope through Test Plan

The objective at this point is the creation of a test plan which details the scope of independent testing. This includes what needs to be tested and to what extent the testing needs to be conducted.

Further, the test plan provides the approach to testing the critical modules, high risk areas, and different types of testing required.

Along with the above parameters, the following are also included in the test plan:

- Identifies who performs the testing as this provides information regarding our QA personnel and their skillsets to the Consortium.
- Annotates the required allocation of time, tools, and environments needed for testing.
- Details entry and exit criteria for testing to ensure the objective gating criteria is baselined.
- Establishes test coverage goals to ensure the requirements under test are covered for testing.
- Provides a standardized process for testing.

- Ensures tests are repeatable across different teams or cycles.
- Ensures traceability of test cases to requirements.

The Test Plan document works as reference for stakeholders on what is being tested and also ensures the application under test is fit for production release. Last, it helps identify any defects that might affect the end users.

3. Identify Test Conditions

Identifying test conditions is a key step in designing effective test cases. Test conditions are the specific aspects of a system or application that are tested to verify system behavior as expected. Identifying test conditions helps in the data creation process which ensures that the system is tested for all different data permutations.

The test conditions are identified through the following processes:

- Understanding requirements – Review the business requirements, functional specifications, and user stories
- Analyzing the use cases and workflows – this helps in understanding the user interactions with the system
- Reviewing design documents to ensure the requirements are being met
- Boundary value analysis of the fields within the application under test

4. Design Independent Test Cases

Test cases form the base of independent testing. Each test case is atomic, self-contained and does not rely on the outcome of other tests.

Each test case is created using the details below to define its uniqueness:

- **Unique ID** – With the help of test management tools like JIRA (used within CalSAWS) are autogenerated.
- **Objective** – High level summary of what the test case is about.
- **Description** – Detailed information about the test case.
- **Preconditions** – Any precursor conditions that need to be satisfied before executing this test case.
- **Test steps** – What the tester needs to execute, documented and provided in a step-by-step process. This is mapped to the “Expected Results” for each test step.
- Some of the best practices our independent testers include as part of this process include:
 - Ensuring independence by resetting the environment or data before each test.
 - Use modular test designs to isolate functionality, so that in the future, if we need to test only specific functionalities, the test case for that functionality can be easily found and executed.

To ensure that the test coverage is complete, the created test cases are mapped in the RTM with the requirements created during the requirements understanding phase of test life cycle.

5. Establish Requisite Test Data

Our process recognizes the importance of creating test data for independent testing as critical to ensuring the team is testing the application under test correctly. This also requires the QA team to possess a very good understanding of the requirements and the application under test.

Through the process of requirements analysis, the team gains an understanding of the requirements and obtains familiarity with the application under test through various discussions

with the stakeholders. Once the requirements are understood and test cases are created, the following process is followed to create the test data:

- Align Test data with Test scope – Map the test data with requirements in RTM to ensure that the data is created for all the requirements and this ensures coverage
- Identify test data as per HHS/CalSAWS project specifications
- Identify data needs per test case (valid, invalid, edge cases) requirement
- Use synthetic data generation methods where data cannot be anonymized from production data to create real-world example test data
- Categorization of test data needs as follows:
 - Positive scenarios
 - Negative scenarios
 - Boundary conditions
 - Edge Cases and exception handling
 - Security and access control scenarios
 - Performance and load testing
- Automate data setup using test data management tool that exists at CalSAWS scripts or other tools
- Implement Data Reusability and versioning through maintaining centralized test data repository
- Tag datasets by scenario, release, test cycle to ensure consistency and traceability

6. Validate and Review Test Cases

Our approach to ensuring the test cases are correct, complete, and traceable is through reviews with multiple stakeholders.

The different attributes of the test case that are reviewed are provided in Table 12 below:

Table 12. Reviewed Test Case Attributes

Test Case Attribute	Description
Clarity	Steps and expected results are clearly written and easy to follow.
Traceability	Linked to specific requirements or user stories.
Completeness	Covers Positive, negative, boundary and edge cases
Independence	Can be executed without relying on other test cases
Reusability	Can be used across cycles or modules
Test Data Validity	Uses realistic and relevant test data
Automation Readiness	Structured to support automation (if applicable).
Compliance	Adheres to standards (e.g., naming conventions, templates)

The test case review process follows the steps below:

- Peer reviews and walkthroughs to gather feedback and ensure completeness and coverage.
- Use checklists to ensure completeness and consistency of test cases.
- Trace test cases back to requirements (RTM) using a test management tool like JIRA.
- Complete updates based on feedback or requirement changes.
- Seek approval of stakeholders on test cases.
- Continuous improvement – based on new changes, update the test cases to ensure their completeness and correctness.

7. Organize and Manage Test Assets

As an industry best practice, we organize and maintain the test assets. This helps ensure the correctness and completeness along with traceability to requirements.

The following method is projected for use to ensure that the test assets are organized and managed using test management tools like JIRA/Zephyr, ALM etc.

- **Categorize Test Assets** – This helps in understanding what the test asset is about and what it does in ensuring that we meet the independent testing requirements. The different test assets are manual test cases, automated test cases, test data, test plans and test strategies, defect logs, traceability matrices, test result reports, and environment configurations.
- **Repository Practices** – Use centralized repositories in the test management tool to ensure version control, role-based access, and traceability to requirements.
- **Standardization and Templates**
 - Use standard templates for test cases, plans, and reports
 - Enforce naming conventions and folder structures
 - Maintain a QA asset checklist for consistency
- **Version Control and Change Management** - Ensure traceability and control over changes through usage of tools like Git, maintain a change log linked to defects or requirements.
- **Tagging and Classification** – classify and tag assets based on their usage for effective management by module/feature, by test type – functional, regression, sanity, automation, performance etc. in the test management tool like JIRA.
- **Archiving and Retention** – to ensure the correctness of the test cases, it is important to manage the test assets. This is done through the following process:
 - Define retention policies for obsolete assets
 - Archive post-release assets for audit and compliance
 - Maintain historical data for trend analysis
- **Access Control and Security** – In order to ensure the test assets are not tampered with and protected, the below restrictions are used:
 - Implement role-based access controls
 - Use masking and encryption for sensitive data
 - Ensure compliance with data privacy regulations
- **Audit Practices** – Audit of the test assets is periodically carried out to ensure:
 - Assets are aligned with requirements and standards
 - Incomplete assets are not being used, and they are archived accurately
- **CI/CD Integration** – As the organization matures, the independent testing team ensures testing activities are integrated with CI/CD activities by:
 - Ensuring the automation scripts are integrated with CI/CD tools
 - Updates test assets to make sure they are up to date for each release
 - Maintains logs and reports for traceability
- **Reporting and Dashboards** – It is very important for the independent testing team to share periodic updates and their insights with project stakeholders. This is done through the following methods:
 - Publish reports to stakeholders periodically on:
 - Test coverage
 - Execution status
 - Defect trends
 - Asset Utilization reports

These reports and dashboards ensure that the independent testing team's insights are shared with stakeholders and transparency is maintained with respect to independent testing.

1.4.1.3 Examples

Team Infosys provides the following two examples to demonstrate our ability to provide the required independent testing support for the Consortium.

Example 1: CalWIN Project Independent Testing Support

During Infosys's prior QA tenure in CalWIN Project, we demonstrated an excellent HHS domain knowledge specifically in California-specific social welfare public assistance programs. Using this specific domain knowledge, we created independent test cases and the requisite test data within specific CA HHS programs based on the given SCR. These examples showcase the Team Infosys deep level of domain knowledge of California HHS programs (such as CalWORKs, CalFresh and Medi-Cal).

- **CalWORKs:**

- CalWORKs Application Process and Requirements (such as Age requirements, Immunizations, SSN, Residency, Assistance Unit/Responsible Persons, Resources, Proof of Relationship and Verifications, Care and Control, and Standard Filing Unit.
- CalWORKs Immediate Need (Criteria and Payment Levels)
- CalWORKs Deprivation and its evaluation
- CalWORKs Income and Budgeting Concepts
- CalWORKs Homeless Assistance (including Temporary and Permanent)
- CalWORKs Welfare to Work (WTW)
- CalWORKs Time Limits (Time Clock, TANF 48-Month Calendar, CalWORKs 48-Month, Exceptions)

- **CalFresh:**

- CalFresh Application Requirements (Beginning Date of Aid, Residency, SSN and Identity requirements, Certification Periods, Missed Interview, etc.,)
- CalFresh Household Composition (Head of Household, Separate Household, Elderly/Disabled, Children Under 22, Budgeting Concepts, Income Test, and HH's with Excluded Members)
- CalFresh Resources/Modified Categorical Eligibility (MCE), Property and Resource Limits, CalFresh Income and Deductions
- CalFresh Recertification
- CalFresh Citizenship/CFAP, CalFresh Work Requirements CFET/ABAWD including exceptions
- Able Bodied Adults without Dependents (ABAWD)
- Expedited CalFresh Services criteria

- **Medi-Cal**

- Medi-Cal Hierarchy of Programs including Mega Mandatory Group, Modified Adjusted Gross Income (MAGI), Medically Needy/Medically Indigent, State only Programs, Insurance Affordability Programs
- Medi-Cal Household Definition (Tax Filers/Tax Household, IRS Tax Filing Statuses, Children under 19 years old or 21 years old full-time students, Non-Tax Filer Rules)
- Medi-Cal Residency (Important Information about Residency (MC214), Principal vs Temporary)
- Medi-Cal Citizenship, 90 Day Reasonable Opportunity Period ROP, Former Foster Youth FFY, Deferred Action for Childhood Arrivals DACA, Systematic Alien Verification for Entitlement SAVE
- Modified Adjusted Gross Income (MAGI) Medi-Cal, Affordable Coverage and Financial Support, Metal Tiers, Types of Insurance, Deductions, Budgeting, Income Verification

Requirements, Changes in Circumstances, Soft Pause, Carry Forward Status, Redetermination and Negative actions

- o Complete Non-MAGI Medi-Cal Program Requirements specific test data

Example 2: Telecommunication Provider QA

For a leading telecommunications provider in Belgium, we transformed their assigned staff from just a testing team to a Quality Assurance unit leveraging Quality Engineering practices. This was completed by leveraging our solution, optimizing their operating model, shifting from Test to QA, and creating unified test automation with standardization of the templates for test cases, requirements, test plan, and checklists. In close collaboration with the customer, Infosys successfully transformed the client team using the four identified focus areas noted below:

- **OPTIMIZED OPERATING MODEL:** KPI Driven Governance/ Value Stream Approach/Business Agility/Test Management CoE/Test Optimization using AI/Prediction Analytics using AI/Lean Processes
- **SHIFT FROM TEST TO QA:** AI Based Cognitive Analytics / Production Analytics / Combined Acceptance / Data Quality Validation/ Performance Validations / Security Tests
- **UNIFIED TEST AUTOMATION FRAMEWORK:** Accelerated Automation- CoE /Unified Platform /Technology Agnostic/AI based- Self Diagnostics /Micro-BOTs /Open Source /Integrated dashboards / CI-CD enabled / Delphix-Data Services
- **STANDARDIZATION:** We used Infosys quality assurance framework to drive transformation, Experimentus (external agent) audited the project for standards and value add, Independent and unbiased review of the project for adherence to process, standards & goals

Using our recommended solution improvements, the client received the following benefits:

- 4.6 M Euros cost saving through multiple levers
- 70% production stability improved from defect leakage reductions
- 35% productivity improvement
- 26% increase in Production Go-Live
- 80% Regression test cases automated
- Around 5 times more test cases added to automation regression

As noted in the two examples, Team Infosys has demonstrated experience implementing cost effective independent testing teams that accelerate production releases.

1.4.2 Understanding and Approach 11

1.4.2.1 Understanding

Team Infosys has a clear understanding and appreciation for Independent Testing as an integral part of an improved release process. It is imperative that applications are thoroughly vetted before promotion into production. Further, as the number of applicants and users working within an application increase, the criticality of a stable code base grows. Given the large user base of the CalSAWS applications, we recognize the importance of our Independent Testing as part of an error free release process. At the same time, Team Infosys recognizes the need for efficiencies in testing solutions while continually reducing the probability of production issues. To meet this challenge, our QA team employs continual process improvements in conjunction with strong M&O vendor collaboration, use of automation and AI as well as leveraging prior test assets. To maximize efficiencies, we recognize the value of existing independent tests being used at CalSAWS by the current vendor. Our approach is based on understanding the currently available test cases, identifying any gaps, and reviewing to ensure the currency of the tests. Using our experience in working

on similar projects to ensure a continuously more effective set of independent tests, the approach is iterative, data-driven, and aligned with evolving system behavior and business needs.

1.4.2.2 Approach

As noted below, our approach provides a strategic and scalable approach that focuses on optimization, automation and collaboration that delivers a continuously effective set of independent test cases without expanding the required CalSAWS resources.

This approach uses the eight defined steps below.

1. Risk Based Testing

One of the approaches to continuously improve the test effectiveness of independent testing is to adopt Risk Based Testing (RBT) to ensure the high-risk areas are prioritized for testing before the lesser areas based on potential failures.

These high-risk areas are identified in collaboration with CalSAWS Consortium as well as based on our understanding of the application portfolio from our CalWIN experience as well as using the below approach:

- Conduct Regular risk assessments to identify the risk areas which are critical to business
- Use historical defect data and business impact assessments analysis to identify the areas in which more defects are found in previous releases
- Align testing priorities with CalSAWS business goals, so that areas that are important to CalSAWS are prioritized

By following the above approach, the independent testing team will make sure that the test assets can be continuously effective without stretching the CalSAWS resources and the following benefits can be attained:

- Identify the defects earlier in the test life
- Reduce cycle times by focusing on what matters most
- Testing becomes leaner and faster
- Critical issues can be identified and resolved earlier, avoiding late-stage surprises

2. Shift-Left Testing with early Involvement

In order to have continuous improvements and effectiveness of independent testing, our approach is utilizing shift-left testing approach wherein the following are ensured:

- Engage early in the development lifecycle with the business analysts and developers in collaboration mode
- Review requirement, architecture and design documents to identify test scenarios proactively
- Integrate Unit and API testing early in the development cycle to improve testing effectiveness

The above steps ensure that the rework is reduced and enhance the test coverage without any additional effort in later stages.

Through this process of engaging early, independent testing team will ensure that the test assets are effective and will benefit the CalSAWS Consortium in the below without extending their resources:

- Test planning starts early ensuring more coverage of requirements through consideration of edge and negative scenarios
- Reduced cost of quality through requirement walkthrough sessions, code reviews
- Early collaboration between the M&O team, Business analysts, from early stages fosters better communication
- Engaging early ensures that the issues are identified early which will enable quicker feedback loops and release times will become faster
- Knowing the independent testing team's early engagement, code quality will be improved, and quality ownership will be across the team not just the responsibility of independent testing team.

Also, as noted, for this engagement we start with the existing set of independent tests, as a baseline and ensure that each test case:

- has clear objectives and expected outcomes.
- can run independently without relying on other tests.
- Is traceable to requirements or user stories.

If there is any gap, we work with the stakeholders to update the test cases to ensure they satisfy the above criteria. Once the review is completed, we baseline the independent test cases for future usage, and they form the basis for any changes in future.

3. Implement Continuous Test Optimization

Our approach to implementing continuous test case optimization relies on regular review and refinement sessions which ensure the test cases are up to date. These are undertaken using the following process:

- Schedule periodic reviews (e.g., sprint retrospectives or monthly QA audits).
- Retire obsolete tests and update those affected by requirement changes.
- Refactor tests to improve clarity, reduce duplication, and enhance maintainability.
- Analyze defects found in production or late-stage testing.
- Identify gaps in test coverage and create new test cases to address them.
- Prioritize tests for high-risk or frequently failing areas.

By leveraging the continuous test optimization techniques, independent testing team will ensure that

- Test assets are efficient by removing the invalid or obsolete test cases and also reducing the maintenance overhead
- Focusing on high-value scenarios will reduce the cycle time
- Ensuring new features and new changes are adequately tested while it enhances the test coverage by identifying gaps in existing test assets and filling them proactively

- By ensuring that the test assets are accurate, the test data quality can also be improved by reducing false positives in test results.

By following the above approach and benefits gained, independent testing team ensures that the test assets are continuously effective over time without expanding the CalSAWS resources.

4. Leverage Test Automation

One of the key approaches to ensure the consistent execution of independent test cases, is to automate the regression and smoke/sanity test cases. This is done by using an open-source tool like Selenium, Playwright, or another CalSAWS-approved tool.

Once the automation suite is ready, integrating with CI/CD pipelines ensures seamless integration with release cycles and early detection of issues.

By categorizing and tagging automated test into multiple categories, the test execution can be managed dynamically based on the release requirements.

Along with the above, we bring in our proprietary AI tool kit where we can use it as an accelerator to improve the effectiveness of test case productivity and test data generation.

Through the automation of test cases, consistency in test execution can be brought in for every release ensuring continuously effective testing by the independent testing team there by reducing the testing timelines for regression and sanity testing.

The regression automation suite will be enhanced for every release cycle based on the new features or changes and thereby effectively manage regression automation suite along with ensuring that the test assets are continuously effective.

5. Use Test Metrics to Drive Improvements

One of the main approaches to improving testing effectiveness is to track and analyze metrics. Based on our experience, the following metrics are very effective, and as such, our approach includes these as part of our solution:

- Test case effectiveness: Percentage of defects caught by test cases.
- Defect leakage rate: Defects missed by QA but found in UAT or production.
- Test coverage: Requirements versus test cases mapped.
- Test execution trends: Pass/fail rates, execution time, flakiness.

By tracking the metrics, the QA team can use the insights gained to Identify underperforming tests, Improve test data quality and adjust test prioritization there by ensuring that the test assets are continuously effective.

6. Enhance Test Data Management

Enhancing test data management (TDM) is critical for improving the reliability, efficiency, and scalability of independent testing.

Our planned TDM enhancements fall into the following eight key focus areas:

- **Test Data Strategy and Planning**

To ensure the test data is properly managed it is critical to define a test data strategy as it aligns with business rules, test coverage goals, and compliance with the requirements.

The data used in independent testing is categorized based on the needs of the application under test as follows:

- Static versus dynamic
- Valid versus invalid

- Edge cases and boundary values

Additionally, our approach plans the data provisioning across the environments and test types (functional, performance, security).

- **Centralized Test Data Repository**

Managing the test data repository is also important to maintain correct and consistent data for independent testing. This is accomplished through test data management tools like Delphix, GenRocket etc., or any existing tool used by the Consortium. Our QA team works with the Consortium to select the best tool suited for the project based on the needs of the Consortium. The different data sets that can be maintained are categorized based on testing types, functional module, criticality, sensitivity, etc.

- **Data Generation Techniques**

For data generation, our team is adept at using the following different data generation techniques:

- Synthetic data generation for scalability and privacy compliance.
- Use data masking and anonymization for production-like data. This ensures that any leakage of customer PII information is kept to a minimum.
- Automate data creation using scripts or tools to support CI/CD pipelines. This reduces the effort spent on test data creation.

- **Environment-Specific Data Provisioning**

As an industry best practice, it is critical to maintain data isolation across different environments. Our test data management approach ensures that data is tailored to each test environment (dev, QA, staging). Furthermore, our approach makes sure that there are automatic data refresh cycles and environment resets after every release, to ensure data quality.

- **Data Quality and Validation**

Another industry best practice, for any testing engagement, includes use of quality data and our approach makes sure that we implement data validation checks before test execution, monitor data for its integrity, completeness and consistency.

- **Security and Compliance**

If part of the independent testing necessarily includes using production data within the independent test environment, our team employs several mechanisms to minimize the potential for data leakage. Our approach includes role-based access controls to sensitive test data to ensure compliance with GDPR, HIPAA, or other regulations. We also verify the use of encrypted storage and secure transmission protocols. However, our initial approach is to minimize or avoid the use of production data through discussion with the Consortium and stakeholders.

- **Integration with Test Automation**

Our TDM approach includes integration with automation tools as this helps in parameterization of test scripts to use dynamic or external data sources. This also enables data-driven testing for broader coverage and reusability.

- **Monitoring and Optimization**

Monitoring and tracking data usage is very important as this ensures the Consortium knows how the data is being used and by which team. Further, it provides insight into the refresh frequency and failure patterns. This aspect helps in optimizing data sets to reduce redundancy and improve execution speed. As part of this optimization, Infosys archives obsolete data and maintains historical sets for audit purposes.

By leveraging the test data management enhancement techniques, the test data requirements for independent testing can be optimized and effective to make sure that the correct test data is being used for independent testing there by reducing false positives, negative results which will improve the effectiveness of testing without expanding the CalSAWS resources.

7. Encourage Collaboration and Knowledge Sharing

As noted previously, we understand that for any project or release to be successful, collaboration with multiple stakeholders across the multi-vendor environment is required. As part of our approach for effective independent testing, we involve developers, business analysts, and product owners in test design reviews to ensure that the test assets are being created accurately, and all the scenarios are being covered for a requirement.

Our approach is to promote the idea that quality is everyone's responsibility through transparent communication using dashboards and tools to keep all the stakeholders informed.

Another key approach is to upskill the independent testing team through the various steps as below

- Training Programs – Structured learning paths and certifications in testing tools and methodologies to improve the skillset
- Cross-application knowledge sessions to ensure that the testing team has knowledge of other applications and if a need arises in other application area, the team is equipped with appropriate application knowledge
- Conduct regular lessons learned sessions after each release and also share best practices.

Through effective collaboration and knowledge sharing within the independent testing team as well as with other stakeholders, independent testing team ensures that the test assets are continuously effective.

8. Tooling and Infrastructure Support

As a separate vendor has responsibility for the CalSAWS Infrastructure, our QA team coordinates with them on the tools and environments to provide support through tracking test case lifecycle, employing version control for test scripts and data, and monitoring test environments for stability and consistency.

In conclusion, this approach ensures that independent testing remains robust and continuously improves over time, all while staying within the existing resource boundaries set by the client.

1.4.2.3 Tools and Techniques

To illustrate ongoing improved confidence in independent test results, a combination of tools and techniques are used to continuously validate, monitor, and enhance the quality and reliability of the test suite.

Our detailed approach and different tools planned for use are annotated below. As needed, these are further discussed with the Consortium to instill stakeholder confidence in our independent testing activities and the results.

1. Test Management Tools

Based on the reference material provided as part of this RFP, we understand that JIRA is the current test management tool for the CalSAWS Project. Our flexible approach calls for using this existing test management tool as our team has significant experience working with JIRA. Further, our assumption is that the Consortium is using JIRA for documenting business

requirements and user stories. While our approach below is based on this assumption, if another tool is used, our approach is easily modified to encompass the current tool.

Our Independent Testing team uses JIRA to manage the testing with the following steps:

- Test Case Management
- Test Execution Management
- Defect Management
- Traceability
- Reporting
- CI/CD Integration

2. Automation Frameworks

Our approach uses a scalable automation framework to ensure repeatable and consistent test execution, remove manual errors, increase coverage, and enable fast feedback loops in CI/CD pipelines.

During our transition-in phase, as we gather information regarding the current automation framework and test scripts, we also create an independent testing road map for future automation as coordinated with the Consortium.

Our automation approach is tailored around the following:

- Early automation at the sprint level improves progressive automation coverage while augmenting automated regression test suites with critical functional test scripts.
- Progressive automation scripts are composed in a modular manner and categorized by business functionalities and features and then used like "Lego Building Blocks".
- These building blocks are aligned to value stream components or features or business processes for more business context testing and drive reuse.
- These scripts are linked to the test cases in JIRA with results from test execution of regression, smoke, and sanity suites in the CI/CD pipelines updated in JIRA.

3. CI/CD Integration

We understand that there are multiple releases in CalSAWS based on the approved SCRs and the vision includes increasing the frequency of the releases. As part of our approach for increased automation and a Shift Left strategy for independent testing, we propose using CI/CD integration to automatically trigger tests upon code changes in the independent testing environment. This in turn provides real-time visibility into the test health, helps in test execution and regression testing for any further code changes early and continuously.

Based on our experience supporting clients and their projects, the steps followed within Continuous Integration and Continuous Deployment are noted in Table 13 below. Our QA team works with the Consortium to implement the steps below as part of our independent testing process improvement activities.

Table 13. Automated CI/CD Tasks Proposed within Independent Testing

Task	Automated Task Description
Source Control Version Management (ADO, GIT)	Source control version management is used to communicate and resolve editing conflicts between multiple developers. Automation team needs to use source control for Automation scripts.
Automated Deployments	When builds are ready for distribution, they go through a deployment process
Environmental Health Checks	CI pipeline is configured to run health checks of the environment before the testing process is invoked

Automated Sanity Testing	Automated sanity scripts are invoked, and detailed reports are generated. Reports are configured as emails to the stakeholders. Reports may also be published through channels such as Microsoft Teams.
OnDemand Test Data	Test scripts generate data on demand from the TDM system
Regression and Functional Tests	Once the Sanity test cases are successful, regression and functional test cases are run automatically.
E2E and NFR Tests	E2E tests as well as performance and security test cases are aligned in the pipeline
Dry Run and Business Acceptance Tests	Usually, dry run and basic acceptance test cases are run in the UAT environment before production deployment
Production Sanity	A lean set of test cases are run in production to verify the production build

As detailed in the earlier section regarding our approach to using CI/CD integration in independent testing, the image in Figure 9 below provides a detailed view on how we use CI/CD in our independent testing efforts.

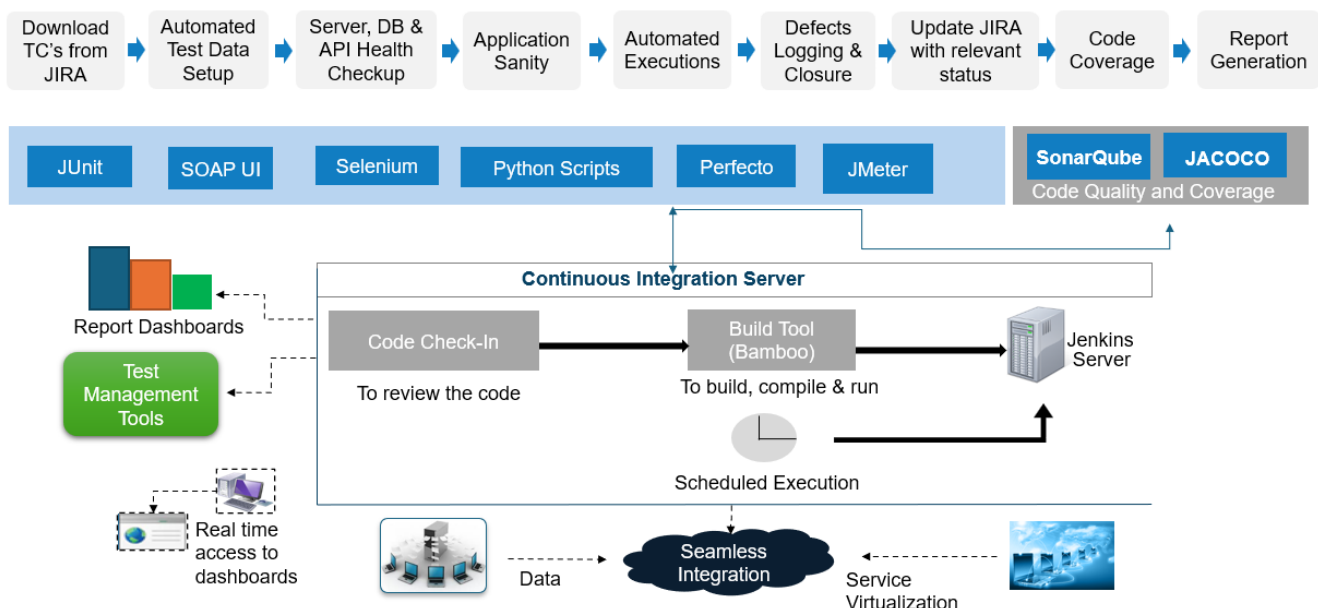


Figure 9. Sample CI/CD Integration

As shown in Figure 9 above, our team is adept at creating a comprehensive CI/CD solution. As part of our solution, we envision working with the Consortium-designated personnel and M&O vendor to define the specific applications needed to extend CI/CD into the independent testing process.

Sanity automation scripts are configured in such a way that failed test cases are rerun to avoid execution failures due to intermittent issues. The CI/CD job setup is designed to have one or more retries to ensure the build consistency. The resulting report is shared across all stakeholders.

Feedback loops and notifications are at the heart of continuous testing and sanity testing. As part of our process the following key feedback checkpoints are completed:

- The Development team is notified of a failed build due at check-in
- The Operations team is alerted to failed environment health checks
- The Development and QA team are notified of failed sanity checks
- TDM is notified for test data unavailability
- The Operations team is notified upon failed deployment

4. Test Data Management Tools

Our approach includes using JIRA as the test data management (TDM) tools as part of our independent testing in consultation with the existing TDM team. Our approach to test data management (TDM) is based on the 4 dimensions - People, Process, Tools, and Technology as depicted within Figure 10 below.

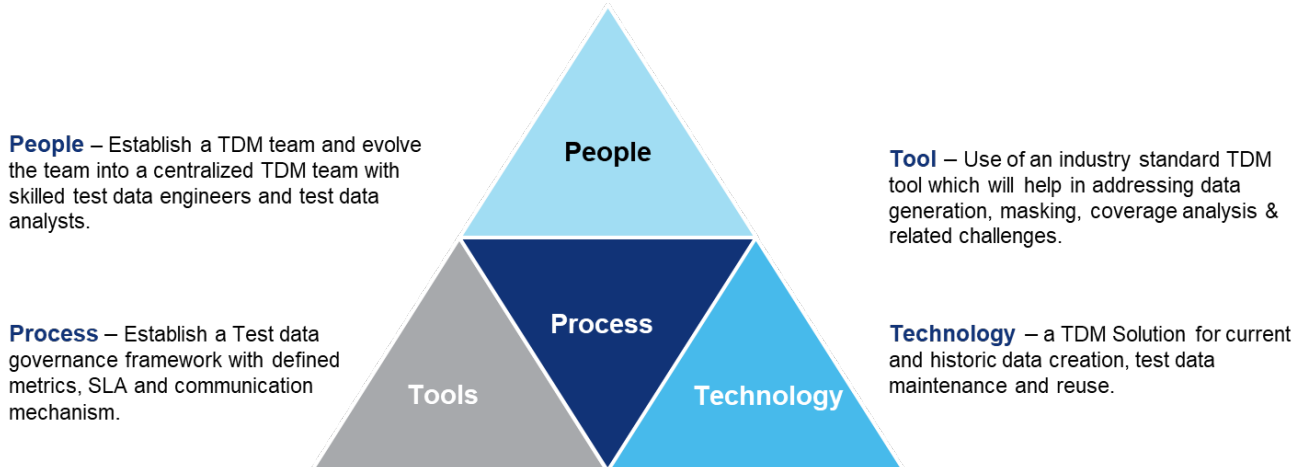


Figure 10. 4-Dimensional TDM Solution

The 4 dimensions illustrated above are further discussed below:

People

- Define test data engineers and test data analysts, Governance Council, TDM roles, responsibilities, and skill sets
- Define a robust onboarding plan with software and access requirements
- Training plan (Application, TDM, Tools and technology etc...)
- Knowledge management plan (Monthly meeting, KM sessions etc...)

Process

- Define Data Governance, Stewardship and TDM Operating model
- TDM Workflow with Masking
- TDM Governance model (Operational, Tactical, Strategic)
- Communication & Reporting Mechanism
- Knowledge Management Plan
- Define KPIs, SLAs, Metrics (e.g., Cost, Quality, Time)

Tools and Technology

Tool fitment analysis is done in consultation with the Consortium, using the following steps:

- Tool fitment analysis and implementation based on capabilities and priorities
- Evaluate feasibility of complimentary tools and implement to work cohesively
- Tool POC (Define Use cases, Key success factors & acceptance criteria)
- ROI calculation with draft timeline for implementing the tool

Our TDM approach is a phased approach with each phase containing applications for which test data management tasks are defined in consultation with the Consortium on the test data requirement. In each milestone, TDM Scripts (masking, subset and data generation) for one application are delivered.

Each phase consists of the following key activities:

- Data extraction from production to data repository for identified application(s)

- Data Obfuscation – Anonymization rules applied in data extraction.
- Modelling of generic data creation functions for the identified application(s)
- Setting up data provisioning mechanisms from Test Data Repository to non-production environments
- Validation of process with the support of application and business owners
- Data quality analysis

This phased TDM approach is depicted within Figure 11 below.

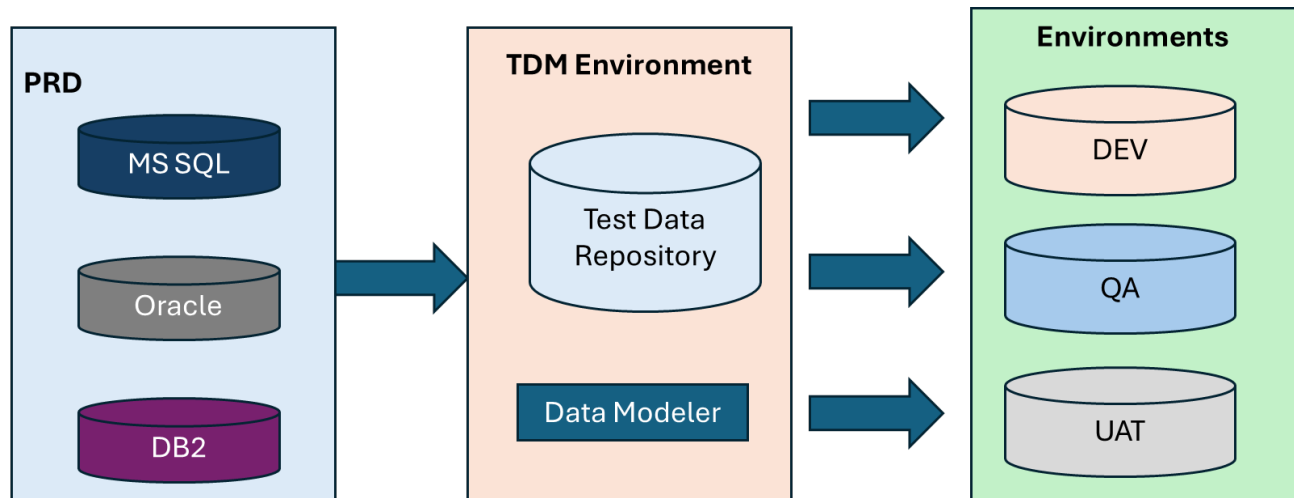


Figure 11. Sample TDM Implementation Approach

5. Defect Tracking Systems

As noted previously, we envision extending the utility of the existing JIRA application to actively track defects. If the Consortium desires to use another tool, our QA team can readily adopt the change.

Our approach to using the defect tracking system is provided below:

- **Link failed test executions directly to defect tickets** – As we execute the test cases, there are chances that the independent testing team detects issues which are logged as defects in the defect tracking systems like JIRA/ALM. The defects identified and logged are linked to the respective test cases and then to the test cycles to maintain traceability when the defect is identified.
- **Track defect lifecycle and resolution** – Tracking a defect for its resolution is one of the key aspects of independent testing as this ensures that the application under test is free of defects and a defect free solution is delivered to customers. Our QA team in coordination with the Consortium, tracks the defects created and works on resolving them using the defect tracking system. Our QA Team presently envisions using JIRA for the CalSAWS Project but we can support other options as needed.
- **Use JIRA dashboards to visualize defect trends and test failure rates** – Our team reports the defect trends and failure rates for any of the features that are part of the release cycle under test. Using JIRA's built in features, Infosys generates customized dashboards and shares with the required stakeholders to assess the health of the applications managed by CalSAWS Consortium.

6. AI-Driven Independent Testing Framework

We integrate AI Capabilities as explained in Section 1.3.3.2 to fundamentally transform independent testing through Generative AI aligned with our Enterprise AI Strategy while minimizing business impact and thus making the overall testing process better, faster, and

stronger. This transformation enables AI-powered test case generation to automatically create comprehensive test cases from requirements and user stories, along with intelligent requirement analysis to identify gaps, ambiguities, and missing scenarios. Autonomous quality gates validate release readiness without manual intervention, ensuring faster and more reliable testing cycles. Rapid test environment provisioning through containerization allows for instant setup of consistent and isolated environments, while scalable test containers and auto-scaling test pods dynamically adjust resources based on testing demands. Additionally, advanced analytics of test failures provide an actionable insight to improve test coverage, optimize execution, and enhance overall quality outcomes.

Team Infosys proposes the use of six different activities to demonstrate and reinforce confidence for all concerned stakeholders and have a positive impact from our independent testing.

1. Traceability Matrix

Based on our experience in executing multiple projects with testing-related activities, it is very important to use a traceability matrix or RTM. This allows us to objectively illustrate that the created test cases cover all the requirements in detail. With the advent of test management tools, it is comparatively easy to maintain the traceability of test cases to requirements. Our approach for implementing the traceability matrix is through the JIRA test management tool.

The process of traceability is executed using the following steps:

- Requirements are available in JIRA
- Testing team links the test cases created to requirements thereby ensuring the test cases cover the requirements
- Test cycles are assigned to a release, and then mapped into respective test cases, and this ensures the execution of respective requirements in that particular release.
- Any defects created are linked to test cases which in turn are linked to the test cycles and to the requirements.

This linking of Requirements to Test Cases to Executions to Defects ensures end to end traceability, identifying any gaps in coverage, while also ensuring the business logic is validated independently.

Further by using JIRA Query Language (JQL) it is easy to build custom reports and filters for the Consortium leadership and other stakeholders.

2. Defect Leakage Analysis

Defect leakage analysis is a critical process in software testing and quality assurance that involves reviewing defects (bugs or issues) to understand their root causes, patterns, and impact. The goal is to improve software quality by preventing similar defects in the future.

The key objectives for defect analysis are:

- **Identify Root Causes** - Understand why the defect occurred—was it due to a requirement gap, design flaw, coding error, or testing oversight.
- **Categorize Defects** - Group defects by type (functional, UI, performance), severity, module, or phase of detection (unit testing, system testing, UAT).
- **Trend Analysis** - Track defect trends over time to identify recurring issues or high-risk areas.
- **Improve Processes** - Use insights to refine development, testing, and review processes to reduce future defects.

The process for doing the defect analysis is detailed below:

- **Defect Capturing/Logging** – To perform defect analysis, it is necessary to have the defect logged in the defect tracking tool. The defect should be capturing the defect details like – summary of the issues, environment, screenshots, test data used for testing, steps to reproduce, any logs if it can be captured with help of M&O team.
- **Defect Classification** – Once the defect is created, it needs to be classified according to the severity, priority, defect type to ensure its resolution at the earliest.

We understand there is defect classification already being used at CalSAWS. Infosys proposes using the classifications noted below as this enables a better classification of defects and helps the Consortium to better understand the defect that is created and make more informed decisions:

- Severity (Critical, Major, Medium, Minor)
- Priority (Urgent, High, Medium, Low)
- Type (UI, Functional, Performance, Security)

As part of the independent testing planning phase, the classification used is finalized during discussions with the Consortium and other vendors, as appropriate. During these discussions, we review the existing classifications and potential advantages of changes to the current labeling.

- **Root Cause Analysis** – Root Cause Analysis (RCA) is important to understand where the issue has occurred. This is done through different methods like – 5 whys, fishbone diagram, pareto analysis. This process identifies the process issue and not the personnel issue. Using these methods, we can identify whether the defect is due to a requirement misunderstanding or design flaw or coding error or testing gap. The RCA process helps in identifying actions that need to be taken by the team.
- **Reporting & Review** – Once the defect analysis is completed, it is very important to share the report with the stakeholders for review, so that meaningful actions can be taken by the Consortium members. This helps reduce similar defects in the future by following actionable steps.

3. Test Effectiveness Scoring

To help the Consortium collectively identify the defects before the changes are deployed to production, Infosys proposes using a metric called Test Effectiveness Scoring. This metric helps the organization to understand how well the test case is identifying the defects in the application.

Test Effectiveness measures the proportion of defects found during testing compared to the total number of defects (including those found after release).

The score is calculated using the formula below:

$$\text{Test Effectiveness} = \left(\frac{\text{Defects Found During Testing}}{\text{Total Defects}} \right) \times 100$$

This scoring helps assess the quality of test cases as a high score indicates thorough testing and low score indicates insufficient test cases and low coverage.

Based on our experience, to improve test effectiveness, the below best practices can also be implemented subsequent to discussions with Consortium:

- **Enhance Test Coverage** – Cover all functional and non-functional areas.
- **Use Risk-Based Testing** – Focus on high-impact areas.
- **Improve Test Case Design** – Use boundary value, equivalence partitioning, etc.
- **Automate Regression Testing** – Catch recurring issues early.
- **Conduct Peer Reviews** – Validate test cases and strategies.

4. Regression and Impact Analysis

We understand that there are periodic changes to the applications based on new features being added to the CalSAWS suite of applications and it requires independent testing by Infosys. Further, the Consortium vision calls for an increased frequency of releases and our approach advances this vision. Whenever there is a change to the application, Infosys proposes to complete an impact analysis of the application undergoing the change and ensure that proper regression testing is conducted to make sure the changes do not affect the existing functionality.

The approach is detailed in the following steps:

- **Understand the change** – Understand what part of code or functionality is getting changed.
- **Conduct Impact analysis and identify areas affected** – Analyze dependencies and integrations with other modules
- **Regression suite updated/executed** – Update the regression suite based on the changes to the functionality. Execute the regression suite using automation.
- **Results evaluated** – Once the test execution is completed, analyze the results to ensure there is no impact to the existing functionality due to the new changes.
- **GO/NO-GO decision taken** – Based on the test results shared by the independent testing team, the consortium can take a decision for production implementation of the change.

As part of our approach, our QA team uses the following best practices:

- Maintain a well-organized regression test suite.
- Use version control and CI/CD tools to track changes and automate testing.
- Implement test case prioritization based on risk and impact.
- Keep a traceability matrix to link requirements, code, and tests.

5. Peer Reviews and Test Audits

As part of our approach for independent testing, we undertake quality assurance practices like peer reviews and test audits. These regular reviews and audits of the test assets help in keeping the test assets up to date and ensure the quality of the test assets and the keep the quality assurance processes in compliance.

Peer Reviews:

As part of the peer review, the test assets are reviewed with the team to make sure that the test assets are complete, aligned with standards, and identify defects. Some of the assets that undergo peer review are – Test Plan, Test Cases, Test Scripts, Traceability Matrix, and Test Results.

Based on our experience, we include the following best practices during our peer reviews:

- Use checklists for consistency.
- Conduct reviews in pairs or small groups.
- Document feedback and action items.
- Use tools like GitHub, Bitbucket, or JIRA for code and artifact reviews.

The benefits of peer reviews are:

- Regular reviews of test cases for clarity and independence.
- Encourages cross-functional input to improve quality.
- Identifies redundant or overlapping tests.

Test Audits:

As per our experience in previous engagements with other clients, it is very important to conduct periodic test audits to ensure that the independent testing team is following the process defined in consultation of the Consortium.

The objectives of this audit include:

- Verify adherence to testing standards and procedures that are implemented in conjunction with the Consortium.
- Assess test coverage and effectiveness by reviewing the test assets like test plans, test cases, and test scripts.
- Identify gaps in documentation or execution if the standards are being maintained, any sections are missing which reduces the test effectiveness etc.
- Ensure traceability from requirements to defects to ensure test coverage for completeness.

Included best practices for conducting test audits include:

- Schedule audits periodically or post-release.
- Use audit templates and checklists.
- Involve QA leads or external auditors.
- Document findings and track corrective actions

Table 14 below provides the key aspects on how the peer reviews and test audits complement each other.

Table 14. Peer Reviews and Test Audits

Aspect	Peer Reviews	Test Audit
Focus	Quality of test assets	Compliance and process effectiveness
Timing	During Test design and planning	After or during test execution
Participants	Peers (Developers, Testing team)	QA Leads, managers, auditors
Outcome	Improved test quality	Process improvements and compliance

6. Test Confidence Dashboards

As part of our approach in providing independent testing services, it is important to provide the Consortium regular testing updates through dashboards to increase the stakeholder confidence in the testing activities. These dashboards provide the Consortium the information required regarding – health, coverage, and effectiveness of testing efforts. These dashboards are generated using the Test Management tool like JIRA or by pushing to data reporting tools like Power BI.

Dashboard Creation Steps

As part of our approach in creating the dashboard, the following steps are followed:

i. Define Objective

Determine what needs to be measured and the intended audience for the dashboard. The different metrics that can be measured varies as per the dashboard requirements like – test coverage, defect trends, pass/fail rates, test effectiveness etc. Further the objective needs to be aligned with business goals like release readiness, risk mitigation.

ii. Identify Key Metrics

To create a dashboard, it is important to identify what metrics are used. Based on our experience in previous engagements, Potential metrics include:

- **Test Coverage (%)** – How many requirements are covered by tests.
- **Test Pass Rate (%)** – Percentage of tests that pass compared to overall test cases.
- **Defect Density** – Number of defects per KLOC (thousand lines of code).
- **Test Effectiveness (%)** – Ratio of defects found during testing versus total defects.
- **Automation Coverage** – Percentage of tests automated.
- **Defect Leakage** – Defects found post-release versus total defects

Figure 12 provides an indicative dashboard that we propose to create in conjunction with the Consortium for independent testing.

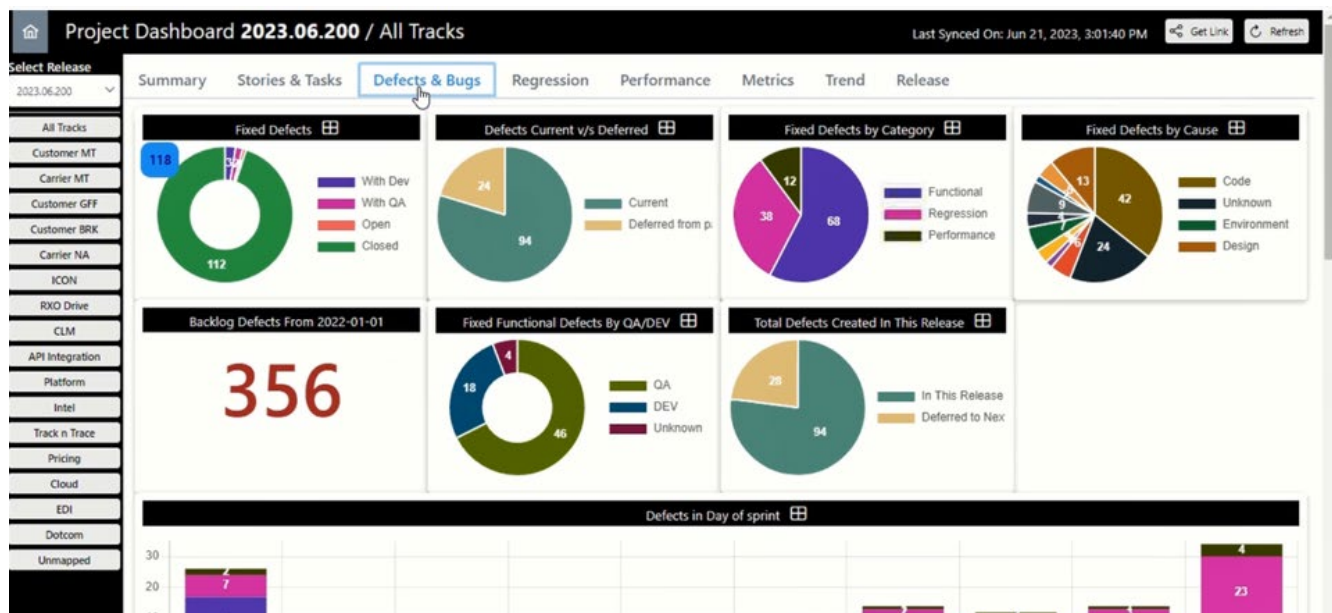


Figure 12. Indicative Sample Defects Dashboard

iii. Data Collection

The data for dashboard creation is collected from different systems within the CalSAWS environment like JIRA and code coverage tools through the M&O vendors. Using the data collected and metrics calculated, the dashboards are created based on the requirements.

The different dashboards allow visualization of metrics like - Test coverage, Pass/fail rates, Defect leakage, Flaky test rate, Automation rate etc.

By sharing the dashboards and associated insights with stakeholders, we build transparency and trust.

1.4.2.4 Examples

The following two examples illustrate how we assisted our customers in gaining increased confidence in their test results while lowering deployment costs.

Example 1: Enhance and provide increased confidence in QA Process for Clinical Trial organization.

For a comprehensive clinical trial services organization providing testing, project management, supply chain, biorepository and biospecimen, and consent tracking solutions for clinical trials, we implemented a legacy modernization project and as part of this project, we assisted them in building a scalable and cross-functional QA team with various testing service capabilities.

As part of the project, we implemented our solution using the following steps to enhance effectiveness and provide increased confidence in the QA process:

- Streamlined the test processes and governance by leveraging industry best practices.
- Utilized test data enablers to consolidate the test data requirement at release level and module level through the usage of test data repositories.
- Used service virtualization techniques to ensure testing is performed within timelines by mocking the responses from other integrated systems.
- Enhanced regression suite through test audit to remove the duplicate and obsolete test cases, adding new test cases to ensure the testing is covering end to end flows.
- Improved test efficiency thorough defect leakage analysis, peer reviews and other process improvements.

By implementing the above solution for the client, they were able to see the benefits below:

- 100% coverage for all testing phases.
- Gaps in requirements were uncovered which resulted in new enhancements to the application.
- Effort savings of approximately \$5,000 for each major release.
- Regression suite is enhanced through automation which increased the confidence in the product being delivered to customer.

Example 2: Test Data Management for Non-Profit Organization

We implemented an enterprise Test Data Management Consulting and Implementation for a nonprofit organization providing public healthcare programs including Medicaid, Medicare and Market place, headquartered in Dayton, Ohio.

With the challenge of being HIPPA compliant, no TDM in place, no standard End-to-End documentation available, we analyzed 125 plus applications in around 3 weeks. The approach below was used:

- **Building the base blocks** - Application De-identification to ensure that the application is not identified from data that is being used from applications like: FACETS, EDW, SAP, Custom DB (housed all custom databases for many projects), Cactus, Choreo and entry level EDI 834, 837, Flat files.
- **Domain De-identification readiness:** Developed a purge and repopulate strategy. De-identify 7 key apps and purge the remaining databases to repopulate the de-identified data from 7 apps.
- Recommended to de-identify SAP and EDW (all three layers – Source raw – staging and Target layer) considering the data refresh methodology and complexity rather than consuming the inbound de-identified data.
- Recommended developing multiple regular expressions to find the PHI / PII fields in each database.
- Recommended Python integration with Delphix for the file formats unable to de-identify using existing Delphix feature.
- Recommended establishing referential integrity via the Delphix TDM tool in EDW as EDW does not have referential integrity to establish PHI / PII fields for data profiling and data de-identification.

Through this approach, we were able to provide the client with the benefits below:

- Reduced cost by 25%
- Faster Time to market is achieved for the projects in below order

- Defined E2E state to move from startup – basic – progressive in 1 year and moving to maturity state in 2nd year
- Recommended data governance function – Data auditing framework. Process and methodology, Test data capabilities

As such, Team Infosys has direct experience implementing and accelerating Independent Testing methodologies that provide tangible, objectively measured results without increasing the costs.

