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PROPOSAL

SUBMITTED TO:

AHCCCS
Arizona Health Care Cost Containment System

SOLICITATION # YH19-0028
AHCCCS Works Portal

DUE FEBRUARY 19, 2019

3000 Bayport Drive Suite 840 Tampa, FL 33607 Ph: (727) 723-0801 | Fax: (813) 289-5359
sstech.us

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1. COVER LETTER

February 18, 2019

Michael Kowren
Senior Procurement Specialist
AHCCCS
701 E. Jefferson, MD5700
Phoenix, Arizona 85034

RE: SOLICITATION # YH19-0028, AHCCCS Works Portal

Dear Mr. Kowren:

System Soft Technologies is pleased to respond to the **Arizona Health Care Cost Containment System Administration's (AHCCCS)** solicitation for AHCCCS Works Portal.

As one of the leading providers of software development, Team SSTech (**comprised of System Soft Technologies and CitizenDeveloper**) acknowledges the challenges the AHCCCS is facing. In helping your organization meet such requirements, we stand out against our competition in longevity, breadth of experience, considerable manpower, and technological edge.

We look forward to your consideration of our proposal and to enter into the contractual agreement to provide all services necessary to fulfill your goals as defined by the solicitation. I serve as the full authority to enter into a future binding agreement. For future and ongoing communications, you can connect with me using the information in my signature below or the assigned primary contact Neha Desai at (770) 391-0801 x123 or Neha.Desai@sstech.us.

Sincerely,

David M. Quish
Senior Corporate Manager
3000 Bayport Drive, Suite #840,
Tampa, Florida 33607
(727) 723-0801 x327
david.q@sstech.us

ATTACHMENT B: OFFEROR's CHECKLIST

Note to Prospective Offerors: This page is added to the RFP as a convenience to Offerors. It is believed to be a complete listing of all submission requirements pursuant to this RFP. However, if a requirement is stated anywhere in the RFP text, yet does not appear in the Offeror's Checklist, the text statement takes precedence over the omission of that requirement in the Offeror's Checklist. **Provide the page number where this item is located within your proposal, in the right hand column. All items must be included and in this order.**

	SUBMISSION REQUIREMENTS	OFFEROR'S PROPOSAL Page #
1	One (1) Original and (2) Hard Copies of Proposal, 1 Electronic Copy	na
2	Submittal Cover Letter	2
3	Offeror's Checklist (see ATTACHMENT B - this page)	3
4	Completed and Signed Offer and Acceptance page	4
5	Signed Solicitation Amendments, if any (signature page only)	5
6	Method of Approach - Written narrative in response to requirements with reference to requirement paragraph number.	16
7	Experience and Expertise of the Firm and Key Personnel – Written Narrative • Successful and reliable experience in related past performance • Detailed related information and resumes of Key Personnel • Organizational Chart	45
8	Pricing Schedule (see ATTACHMENT A)	56
9	Statement of Intent to provide Certificate of Insurance	61
10	Detailed Legal Analysis (If any portions are requested to be kept confidential or proprietary) If any pieces of your proposal are **being requested to be kept confidential, and withheld from public viewing**, please submit an additional redacted copy of the proposal ON A SEPARATE CD. Our office does not require a hard copy of the redacted proposal, only an electronic copy. This will ensure that our office is crystal clear on which version of your proposal is acceptable for public viewing.	62

OFFER AND ACCEPTANCE

OFFER

The undersigned Offeror hereby agrees to provide all services in accordance with the terms and requirements stated herein, including all exhibits, amendments, and final proposal revisions (if any). Signature also certifies Small Business Status.

Arizona Transaction (Sales) Privilege Tax License No.: Not applicable

Federal Employer Identification No.: 59-3583134

E-Mail Address: david.q@sstech.us

System Soft Technologies LLC
Company Name

3000 Bayport Drive, Suite #840
Address

Tampa | Florida | 33607
City | AHCCCS | Zip

For clarification of this offer, contact:

Name: David M. Quish

Title: Senior Corporate Manager

Phone: (727) 723-0801 x327

Signature of Person Authorized to Sign Offer

David M. Quish
Printed Name

Senior Corporate Manager
Title

CERTIFICATION

By signature in the Offer section above, the Offeror certifies:

1. The submission of the offer did not involve collusion or other anti-competitive practices.
2. The Offeror shall not discriminate against any employee or applicant for employment in violation of Federal Executive Order 11246, AHCCCS Executive Order 2009-09 or A.R.S. §§ 41-1461 through 1465.
3. The Offeror has not given, offered to give, nor intends to give at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a public servant in connection with the submitted offer. Failure to provide a valid signature affirming the stipulations required by this clause shall result in rejection of the offer. Signing the offer with a false statement shall void the offer, any resulting contract and may be subject to legal remedies provided by law.
4. The Offeror _____ is / __X__ is **not** a small business with less than 100 employees or has gross revenues of $4 million or less.
5. The Offeror is in compliance with A.R.S. sec 18-132 when offering electronics or information technology products, services, or maintenance; and
6. The Offeror certifies that it is not debarred from, or otherwise prohibited from participating in any contract awarded by federal, AHCCCS, or local government.

ACCEPTANCE OF OFFER (to be completed by AHCCCS)

Your offer, including all exhibits, amendments and final proposal revisions (if any), contained herein, is accepted. The Contractor is now bound to provide all services listed by the attached contract and based upon the solicitation, including all terms, conditions, specifications, amendments, etc., and the Contractor's Offer as accepted by AHCCCS.
The Contractor is cautioned not to commence any billable work or to provide any material or service under this contract until Contractor receives purchase order, contact release document or written notice to proceed.

This contract shall henceforth be referred to as Contract No. _____.

CONTRACT SERVICE START DATE: _____.

AWARD DATE: _____

_____

MEGGAN LAPORTE,CPPO, MSW, AHCCCS Chief Procurement Officer

4. SIGNED SOLICITATION AMENDMENTS

None

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5. THE NEW WAY TO DELIVER SOFTWARE

5.1.1 Are you Prepared to Read Something Different?

Stop! This solution is different from any other responses you are receiving.

Your team probably decided to pursue a COTS solution because they are hoping for an on-time and on-budget delivery of a solution that is battle tested. Or, you may simply want to satisfy the procurement with a minimum of headaches and time consuming bug testing and resolution. Hence, the decision to pursue a COTS solution. Does that sound familiar?

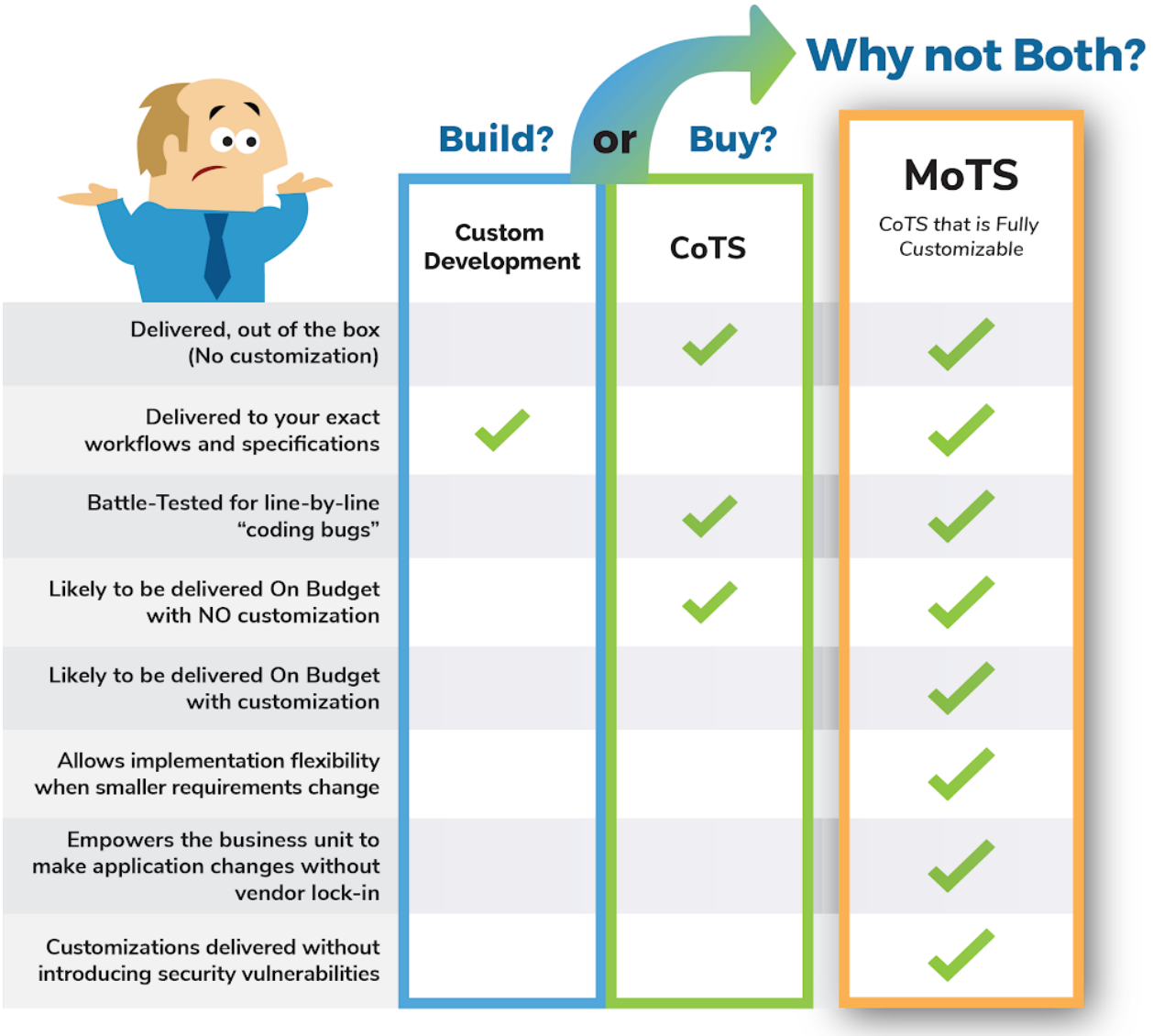
But, the reality of buying a COTS solution is not as simple as walking into a store, picking up a box, and hoping for the best. You will have to change some of your processes, and that is never easy to do. And you will likely want to customize your COTS solution, but that's frequently even more difficult to do, and in some cases the vendor won't even support it.

Deploying a COTS solution is never as easy as it might seem.

Building a custom solution is not easy either. Hence the age old dilemma; do you Build or do you Buy? ...what to do?

Our team understands your challenges. We've been there. We solved the issue, over 1,000 times.

If your team is open to a new way to deploy software that brings you the benefits of a COTS solution AND the benefits of a custom solution, read on!



Build or Buy? Correct Answer: "Yes Please!!!"

Your ideal solution is one that is specifically built for your needs, but does not come with the time, expense and risk of a Custom Solution development project.

CoTS (Commercial, Off the Shelf) - Assuming "your needs are just like every other organizations needs", then this is the path for you. CoTS is a pre-built software solution that is widely deployed to many customers. With this option you know what features you are getting, but, you can't change any of those features beyond some minor configuration. And if the solution doesn't match your needs

exactly, or if there are characteristics that make your organization different from other organizations, then you have no choice but to pursue custom development.

Custom Development - Hire a firm to build a software application for you from scratch. Theoretically, this approach gets you exactly what you want, but are the drawbacks worth it? Traditionally, Custom Development projects have less than a 20% success rate, more commonly experiencing delays to schedules, massive cost overruns, and frequent change orders throughout the project. Fully 1 in 3 customer application development projects never get launched.

The NEW approach: MOTS - Wouldn't it be nice to have the ease and certainty of CoTS, with the customizability of Custom Development, quickly and affordably? Enter the revolutionary new approach to software deployment - MOTS (Modifiable, Off the Shelf). Our CitizenDeveloper Platform is specifically designed to give you the best aspects of both of these traditional approaches. By using a highly configurable platform (which has been battle tested) as the underpinning of your CoTS application, our team is able to quickly deploy a CoTS solution and change it to meet your exact needs and processes. This is truly the best of both worlds!

6. EXECUTIVE SUMMARY

System Soft Technologies, armed with the **CitizenDeveloper Platform**, helps clients **TRANSFORM** their programs, **EXECUTE** more effectively, and **PROTECT** their assets. Whether modernizing legacy applications or deploying commercially available applications, you will become more agile and adaptable in an ever-changing environment.

For the purpose of this scope, System Soft Technologies and CitizenDeveloper, together are referred to as **Team SSTech** in this response.

Team SSTech's contribution to AHCCCS:

- Cutting edge technology replacement
- Best in class SLA agreements out of the box
- Proven, meaningful process improvements
- Unmatched Rapid Application Deployment processes

6.1 Common Challenges

Most organizations experience challenges with things like needing a system to track and report eligibility and enrollment requirements, track participant activities, and assess the value being provided to participants and the community. Sound Familiar? AHCCCS is not alone, we specialize in solving these types of issues.

6.2 Let's get Specific

You've clearly identified the need for a modern, centralized Application, and you have worked to define the specific processes, needs, and challenges of your current systems. You've already taken the first step, and we are prepared to take you across the finish line. The following summary presents a brief overview of what we are prepared to do for you:

The AHCCCS Works (AW) Portal will provide a comprehensive, efficient, and secure system for tracking participant eligibility and enrollment status, the completion of required activities to demonstrate continued eligibility, or exceptions due to extenuating circumstances. The portal contains all of the tools and functions needed to effectively meet the needs of the AW program including user management and security, an effective customer dashboard, education and resource management, exemption requests, reporting of engagement activities, submitting good cause requests for eligibility exceptions, documentation and notification management, and the management of data between the AW Portal and other related systems.

6.3 Take Time to Look around

We hope you will take a moment to look around at other solutions. It is even better if you have ever tried traditional software development. This means that you've already found that canned solutions either give you way too many options, or simply do not solve your needs, and that custom

development is incredibly difficult.

6.4 Our Solution

This proposal is not like other proposals you will read. Our product is the result of almost two decades of single minded, focused research and development into solving precisely the problem of software which you now face. And our technology professionals bring decades of experience having implemented hundreds of these solutions all around the world. But best of all, unlike with any other solution you are evaluating, you will be able to leverage non-technical team members within your unit who can use this cutting-edge technology to further tailor this solution over time as your needs evolve. And through all that polishing until perfection, the platform will continue to deliver world-class security, scalability, and performance through incredible core technologies.

Your software is hosted in a High Availability environment on the Google Container Engine, ensuring that there is no 'downtime', or challenges with access. We back your solution with some of the best Service Level Agreements available on the market, including Availability, Security, and Performance.

The Statement of Work detailed herein describes the specific capabilities of our proposed solution, including an implementation timeline that you will find to be shorter than any other comparable solution. This means we will deliver your fully configured software faster than anticipated.

There is simply no better choice on the market to deploy your AHCCCS Works Portal.

6.6 Company Overview – System Soft Technologies

Founded in 1999, System Soft Technologies provides clients across multiple geographies with cost-effective, innovative IT consulting services. We believe the best results come from employing a collaborative, client-centric approach in everything we do, and we strive to bring the best value to our clients and motivate our consultants to advance their capabilities continuously within their respective domains. Our mission is to provide clients with innovative IT consulting and solutions, and to foster an environment that creates a collaborative business experience while producing business outcomes.

With a strong financial strength of our parent organization, we have a multi-year strategy for investments in people, infrastructure, processes and building new service offerings. We have invested ahead of the curve by establishing strategically located, state-of-the-art delivery centers so that we can scale up to address our client requirements. Our centers are characterized by cutting-edge technology infrastructure as well as stimulating, pleasing working environments.

- **Execution Excellence:** Delivery excellence is provided through a focus on tool and metric driven delivery model, strong knowledge management and strict adherence to quality norms. We have strong experience in application development, product development, re-engineering, application support and web enabling applications across technologies.
- **Strategically Located Presence:** SSTech has a strong North American presence, with corporate headquarters in Tampa, Florida; and branch offices in Herndon, Virginia; Atlanta, Georgia; Plano, Texas; Sunnyvale, California; and Toronto, Ontario. This allows us to serve our clients more efficiently, providing local labor needs as well as the ability to address any onsite issues easily and quickly.
- **Collaborative Partner:** Our leadership team pays close attention to all of our relationships. We remain fully committed to the success of this initiative and are willing to invest in necessary tools, facilities, and resources to achieve the same. This results in accommodative, flexible and agile relationships with our clients.

6.7 Company Overview - CitizenDeveloper

6.7.1 CitizenDeveloper - SaaS Software Provider

CitizenDeveloper, with its parent Express Dynamics LLC d/b/a WorkXpress, has been pioneering cloud based SaaS solutions for almost 20 years. On our platform we have globally deployed hundreds of SaaS solutions across a wide spectrum of public and private sector industries on five continents, culminating in the most advanced, powerful, scalable, and secure platform for the rapid development of enterprise-grade software products.

CitizenDeveloper is located in Harrisburg, PA, across the street from Pennsylvania's Capitol Complex, and utilizes our local staff to deliver all products and services. CitizenDeveloper CEO, Treff LaPlante, founded our company in 2003 and remains dedicated to the company's mission to disrupt the software industry by providing superior software products through our revolutionary

CitizenDeveloper Platform. Using the CitizenDeveloper Platform results in a 90% reduction of time, cost, and risk over traditional programming – as validated by objective evaluators and independently verified in a study done by Harrisburg University. This allows the CitizenDeveloper Platform to provide high quality applications at a tremendous value without the need for offshore development!

Here are just a few key points about our past experience:

700+ projects delivered with an average estimation variance under 5% with a 90% reduction in the time and cost of a traditional model.

Our average new implementation is successfully delivered in 13 weeks.

Since no traditional coding is required, the risks of vulnerabilities and code errors are greatly reduced. With over 300,000 users worldwide, the code has been hardened against intrusion and platform bugs have been minimized.

To date, there have been zero (0) instances of exploited code vulnerabilities or compliance violations.

Our team is dedicated to fully supporting the AW Portal with the most robust set of security, scalability, and performance SLAs generally available in the industry today, and to ensure the success of your project we enable continuous development of new features until the product is perfect for your needs. We believe that the AHCCCS will find our solution as a perfect fit to satisfy the needs of the AW Portal project.

7. PROJECT OVERVIEW

The Arizona Health Care Cost Containment System (AHCCCS) is seeking a solution for the AHCCCS Works (AW) Program. The solution provides a centralized system to securely house and process AW Participant data and activities in conjunction with the HEAplus eligibility and enrollment system and the Arizona Technical Eligibility Computer System (AZTECS). The solution allows the program to identify and manage individuals with current Nutrition Assistance and/or Cash assistance eligibility to ensure that those individuals are meeting requirements to continue with those program as set forth in the Waiver Amendment Request to the current Section 1115 Waiver.

The proposed solution is designed to be deployed on the revolutionary CitizenDeveloper platform. Developed from cutting-edge technologies and dynamically scalable, the proposed solution provides the full functionality described in the RFP, but also allows that functionality to be easily configured by business level users as needs change. By leveraging technologies such as Natural language Processing and containerized microservices, the solution truly meets the needs of the future.

Our no-code platform allows our team to deploy highly-configured applications in a fraction of the time required by a traditional coding environment, using drag and drop interfaces that are significantly more functional than tools that are available in the market today. We've partnered with industry leaders in Infrastructure services, such as Google and AWS, which allows our team to provide best-in-class SLAs for Availability, Security, Performance, Support, and Disaster Recovery.

Our team has experience deploying solutions for a wide range of clients on 1000+ deployed applications supporting users across 5 continents. We fully understand, acknowledge, and are prepared to execute on the deliverables and services detailed in the RFP and look forward to further conversation with your team.

There simply is no better solution to deploy a cloud-based software than the CitizenDeveloper platform.

7.1 Method of Approach

7.1.1 (5.1) - General Requirements for the Portal

The AW Portal is designed to meet all specific needs of the project as outlined in the RFP. As part of the robust and highly configurable platform design, there is virtually no limit to the ability of the platform to meet and even exceed the system requirements. The platform may be configured as defined during requirements gathering conversations. Any aspect of the standard processing workflows may be altered prior to deployment, or post-deployment by internal business users.

Appendix A - Additional Information provides specific and detailed explanations of the system capabilities. Language options are available and are discussed and planned during the requirements gathering process to ensure the chosen option is optimal for all users. The CitizenDeveloper platform is fully compliant with ADA and ICT accessibility standards as outlined in the accessibility section of this document. The platform is available on PCs, smartphones, and tablets (mobile-friendly) as outlined in the section entitled *Supported Client Technologies*. The platform is subject to robust security standards as outlined specifically in the *Security and Compliance* section of this document.

Additional requirements such as compliance with specific standards, guidelines, and mandates are either built into the system or configured prior to deployment based on the specific needs of the platform.

7.1.2 (5.2) - AW Splash Page

The AW Portal provides customers with an easy-to-use and intuitive splash page for use by customers with various user roles. Because the system is highly configurable, the splash page will be deployed with all required capabilities displayed but can be altered later by internal business users to accommodate any future changes.

During the system design process, the splash page will be designed to replicate all State branding/logo and design requirements. Links will be included so that all users can access specific resources and help functions. Additional capabilities are included and are based on user roles that are assigned by the system administrator. For more information regarding access and identity management, please refer to the section on *Identity Management* found in Appendix A of this document.

7.1.3 (5.3) - Login to Customer Account in Portal

The AW Portal requires specific access levels and security settings to ensure security and privacy for both the system and its users.

The solution allows for the creation, editing, and deletion of user accounts with system access granted via username/password requirements. The solution supports the creation of role-based user

Profiles and user Groups based on the needs of those individuals and groups within the system and as agreed upon during the requirements gathering process. The assignment of roles ensures that accesses and permissions within the system are granted only to appropriate users. Restrictions may include access to specific fields, forms, documents, and other data. Authorized users have the ability to create, edit, and manage the values and fields of various functions within the solution.

The CitizenDeveloper platform comes with robust security safeguards built in and any specific or additional requirements are determined during the requirements gathering process. More detailed information can be found in *Appendix A - Additional Information*.

7.1.4 (5.4) - Customer Dashboard

The AW Portal Customer Dashboard is the landing page for customers following secure access to the system. The dashboard serves as the home base for customers to access resources and information, and to perform all needed actions as a participant the the AW program.

The highly configurable CitizenDeveloper platform ensures that all fields, links, and action requests are pre-built into the system, the details of which are all determined during the requirements gathering process. The ease of use of the platform ensures that any changes needed to the dashboard can be made by internal users after deployment, if needed.

The platform uses APIs to link to any external agencies and resources that the customer may need.

7.1.5 (5.5) - Education

Similar to other aspects of the AW Platform, the system is configured to allow access and editing capabilities based on user-roles as well as branding/logo designs and page design. All details are determined during the requirements gathering process and come built into the system at deployment. The ease of use of the platform ensures that any changes needed to the dashboard can be made by internal users after deployment, if needed.

7.1.6 (5.6) - Resources

The AW Platform serves as a source of information for its users and provides them with information that is important and relevant to their needs. The information can be in the form of links to other sites, informational banners, and automatic notifications. The AW Platform can itself be a resource by using surveys to collect information from users that provides relevant feedback for the agency. Survey results can be compiled into reports for analysis.

All resource needs are determined during the requirements gathering process and are built into the platform at deployment. Additional information regarding Notifications and Reporting capabilities can be found in Appendix A of this document.

7.1.7 (5.7) - Orientation Period

The primary function of the AW Portal is to track the eligibility requirements of AW participants to ensure that they are meeting the hourly requirements to remain in the program, or to track exemptions from meeting those hourly requirements.

The ease of use of the CitizenDeveloper platform allows configurations to be made to the platform prior to deployment to accommodate the agency's needs. The platform can easily be fitted with conditions and workflows that trigger or suppress certain activities and/or requirements. As such, the platform can be easily designed to indicate that a program participant is in the 3-month orientation period, and that during that specific timeframe the participant will not be required to enter engagement activities, but can request exemptions. The workflow is designed to change the participant's requirements when the end of the orientation period is reached.

7.1.8 (5.8) - Exemptions

Participants in the AW program must meet specific eligibility requirements to remain in the program, but can request exemptions based on specific criteria such as age, residency, student status, and medical issues. As such, the exemption request process is an important element of the Platform.

During the requirements gathering process, all system requirements will be determined and configured into the system prior to deployment. This includes all required fields, field selections, calendaring functionality, system-generated notifications, etc. The built-in workflows will ensure that the information provided by a participant moves the exemption request through the review and determination process, thus ensuring that the system properly credits the participant with an approved exemption for a specified length of time.

The ease of use of the platform ensures that any changes needed to the exemption process can be made by internal users after deployment, if needed.

7.1.9 (5.9) - Customer Reporting Activities

Participants in the AW program are required to report activities that are performed by the individual in order to meet the eligibility requirements to remain in the program. The ability to report these activities accurately and in a timely manner is vital for program participants.

During the requirements gathering process, all system requirements will be determined and configured into the system prior to deployment. This includes all required fields, field selections, calendaring functionality, system-generated notifications, etc. The built-in workflows will ensure that the information provided by a participant is recorded in the system under the participant's account for proper credit toward the required hours. Notifications may be pre-built into the platform to advise participants if requirements are met or not met for a given reporting month.

The ease of use of the platform ensures that any changes needed to the exemption process can be made by internal users after deployment, if needed.

7.1.10 (5.10) - Reporting Requirements

All data elements in the AW Portal receive a unique identifier within the system that allows all data to be compiled into the database, which can be searched, filtered, exported, and reported on by staff using the standard solution toolset. The CitizenDeveloper platform comes equipped with a robust set of built-in reporting capabilities to assist the agency in compiling and analyzing a wide variety of data. The platform is also designed to allow the agency to create its own reports as needed. Further details can be found in Appendix A under *Reporting Capabilities*.

7.1.11 (5.11) - Good Cause

Similar to requesting an exemption, the AW Platform also includes the capability for a participant to enter "Good Cause" requests when the hourly reporting activity requirements will not be met during a reporting month.

During the requirements gathering process, all system requirements for Good Cause requests will be determined and configured into the system prior to deployment. This includes all required fields, field selections, calendaring functionality, system-generated notifications, etc. The built-in workflows will ensure that the information provided by a participant is recorded in the system under the participant's account and that appropriate action is taken based on the information provided.

The ease of use of the platform ensures that any changes needed to the exemption process can be made by internal users after deployment, if needed.

7.1.12 (5.12) - Document Management

The AW Platform includes a variety of document management capabilities pre-built into the system. Additional specific needs are determined during the requirements gathering process and included at the time of deployment. This includes the types of documents supported, actions to be taken, workflow designs, storage, etc.

Additional details regarding the platform's capabilities can be found in Appendix A under *Document Management*.

7.1.13 (5.13) - Exchange of Data

The AW Platform is linked with the HEAplus eligibility system. The two systems can exchange eligibility data that is relevant to the AW participant's program eligibility and enrollment through an API that is configured into the AW platform. Through the requirements gathering process, all details are determined regarding the types of transactions to exchange data and all of the relevant fields, information, dates, approval status of exemption/good cause requests, etc.

The ease of use of the platform ensures that any changes needed to the exemption process can be made by internal users after deployment, if needed.

7.1.14 (5.14) - Historical Monthly Status Summary

As part of the embedded reporting functionality described above and in the *Reporting Capabilities* section of Appendix A, the AW Platform is designed to include a variety of reporting templates as well as reports that are customized by the agency as needed to gather and analyze important data. That same capability allows the agency to create any needed report(s) for the Historical Monthly Status Summary.

7.1.15 (5.15) - Non Customer Permissions

As outlined in section 5.3 and in the *Identity Management* section of Appendix A, the platform is designed to allow for permissions based on user roles to meet the needs outlined under Non Customer Permissions.

7.1.16 (5.16) - Testing Environment

The AW Platform incorporates rigorous, multi-stage testing disciplines to bring factory-level control to the software development process. These various testing disciplines overlap to bring the highest level of deployed software quality while minimizing the Client's time commitment and expense. Please see the section on the *Software Development Lifecycle (SDLC)* in Appendix A for additional information.

7.1.17 (5.17) - Infrastructure Upgrades

Due to the AHCCCS portal being deployed on the CitizenDeveloper Platform as a cloud-based implementation, the system is always updated to the most current version. There is no need to manually upgrade the application – the Platform manages your versioning for you. Updates are non-destructive, and do not cost additional – this is a service that we provide under our SLA's.

7.1.18 (5.18) - System Issues

The CitizenDeveloper platform includes detailed and robust ITIL-inspired service management programs to ensure that system issues are addressed in a timely and efficient manner. Please refer to the section entitled *IT Service Management (ITSM)* in Appendix A for further details.

7.1.19 (5.19) - Customer Survey

The AW Platform can easily be configured to create a survey to go out to participants who report community engagement activities as part of the eligibility requirements. Through a predetermined workflow, the platform can be set up to create the survey for a specified number of participants at timed intervals and with specific questions to be determined by the state. The platform's configurability functionality allows for the survey criteria to be edited as needed by authorized business users.

7.1.20 (5.20) - Hosting Requirements

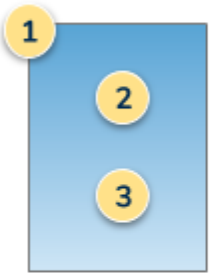
The AW Platform will be hosted and executed based on standards set forth by the Arizona Strategic Enterprise Technology (ASET) Assurance group.

Detailed information regarding Hosting can be found in Appendix A under *Hosting Options* and *Hosting Recommendation.*

7.1.21 (5.21) - System Architecture Document

Please see the Architecture diagrams below. As the solution is configured specifically for the State, detailed architecture documents, including required interfaces (PMMMIS/HPMMIS, etc.) will be provided when integration information is received from the State, prior to implementation.

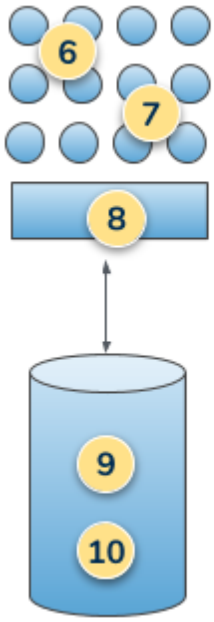
Page Performance Architecture (with SLA)



Front End: Single Page Application

1) Single-page (React.js) application structure
2) Javascript front end supports rapid rendering of page content
3) Bootstrap provides easy and fast CSS Theming

4) Websockets provide real-time data updates of individual key-value pairs
5) Asynchronous javascript processes page send/receive calls in parallel



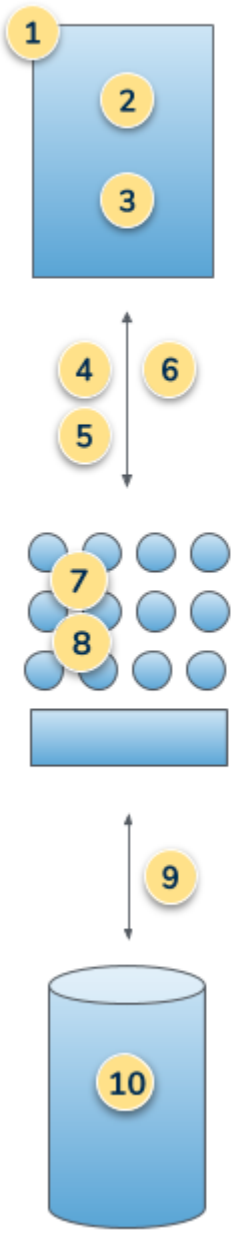
Back End: Stateless, Containerized, Asynchronous Microservices

6) Node.js backend
7) Asynchronous, robust messaging queue for parallel processing between Microservices
8) Rapidly add/delete or shrink/grow microservices and/or hardware in response to demand

Database: Webscale SQL (Spanner or subst.)

9) Automatically add database nodes in seconds to support demand
10) Supports 2,000 writes/sec/node and 10,000 reads/sec/node (standard deployment is 3 nodes: 6,000/30,000 per sec)

Security Architecture (with SLA)



Front End: Single Page Application

1) "Single page app" code 100% centrally managed and hardened
2) De-identified meta data specifies page appearance
3) De-identified key-value pairs specify the data displayed

4) SQL and malicious js is stripped
5) All database queries subject to server-side record security
6) TLS 1.2 2048 bit encryption

Back End: Stateless, Containerized, Asynchronous Microservices

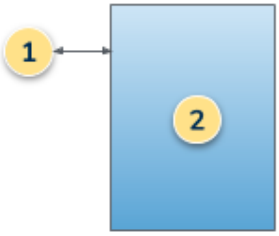
7) Services code centrally hardened. Processing restricted to metadata and key-value pairs
8) Services sit behind multiple layers of network security and are authenticated to speak only to each other

9) Record security applied against all database queries

Database: Webscale SQL (Spanner or subst.)

10) Supports acid, transactional SQL that is cloud scalable

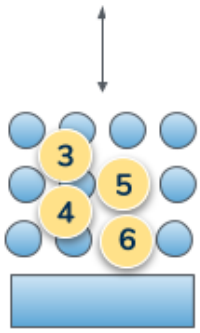
Availability Architecture (with SLA)



Front End: Single Page Application

1) CDN for Global, geo-redundant delivery of single-page application code and structure

2) React/Flux stores for in-memory data binding



Back End: Stateless, Containerized, Asynchronous Microservices

3) Geo-redundant distribution of services

4) Stateless microservices enable scaling and mitigate code faults or errors

5) Ephemeral containers mitigate system faults and support distribution, scaling

6) Systems rapidly self heal in the event of a service error or code fault

7) Data controllers are database-neutral. Supports NoSQL, SQL, Graph, bulk storage, cold storage databases

Database: Webscale SQL (Spanner or subst.)

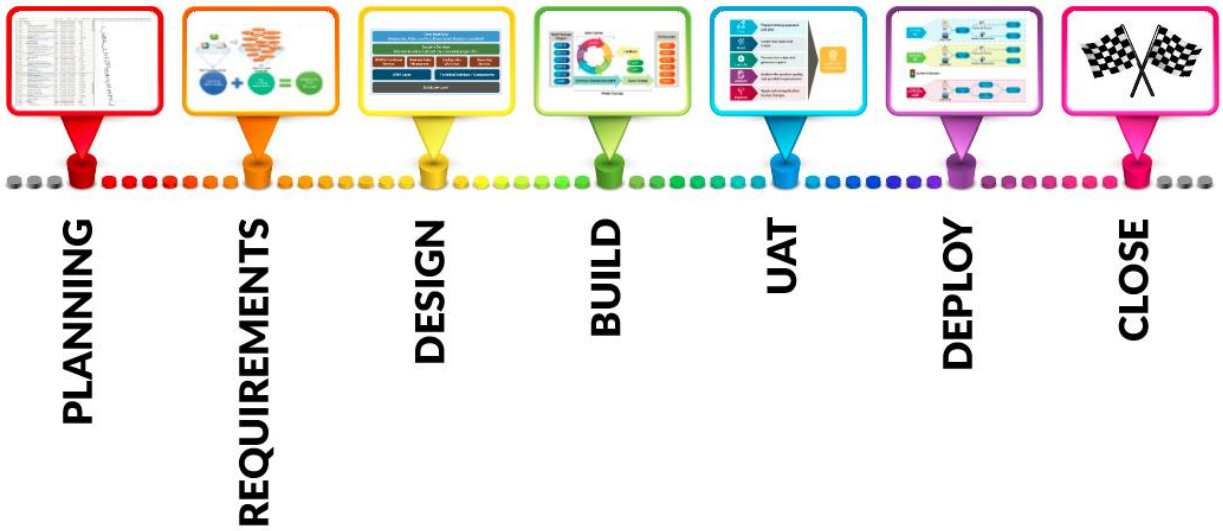
8) Geo-redundant db nodes support up to 99.999% availability

7.1.22 (5.22) - Project Management

Team Team SSTech believes that a clear approach to plan, execute and monitor & control is very important to deliver the solution and ensure all functional requirements are met.

Our PMP certified and highly experienced project managers will be using the phased approach depicted on the next page in order to deliver this project successfully.

Project methodology



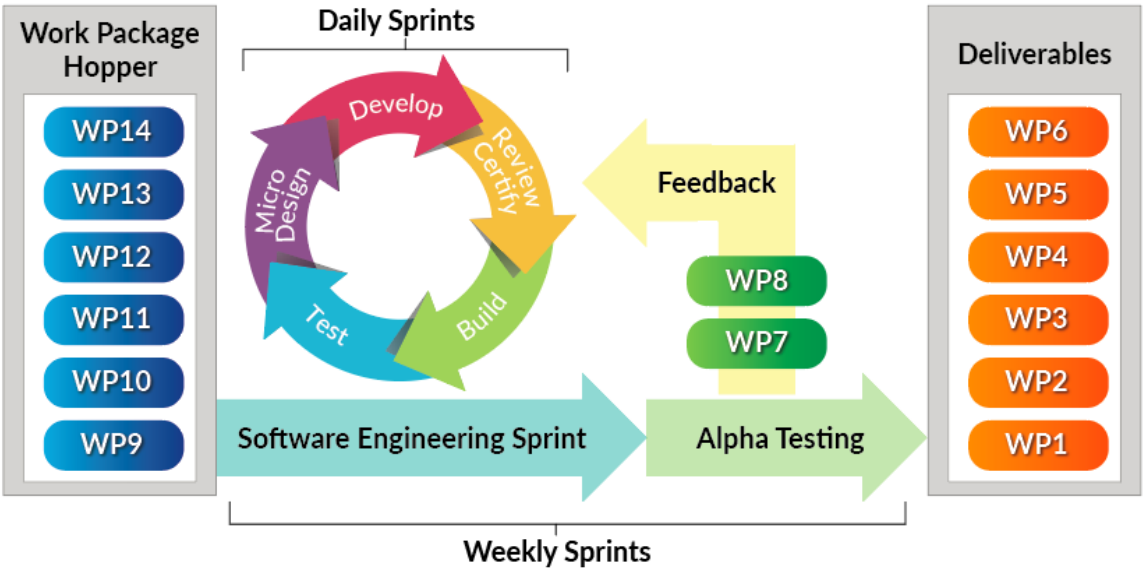
We will also utilize Agile SDLC to ensure tight coordination and iterative activities with the business. Under this methodology, design, development, and testing tasks will be conducted on iterative basis and delivered in smaller chunks every week.

Work Packages

First, the Work Breakdown Structure (WBS) will be created for the core functionalities based on the initial requirements identified during the Requirement Gathering sessions. The WBS is then subdivided into work packages that can be independently executed by the engineering team.

The agile development cycles consists of daily and weekly sprints, as depicted in the figure below.

Agile SDLC development cycle



Daily Sprints

The engineering team members take the work packages and iterate them through their daily sprints consisting of micro design, development, adding to the software build, certification, and testing.

Weekly Sprints

The weekly sprint involves delivering the work packages completed by the daily sprints. As part of the weekly sprints, the team will collaborate in code reviews, architecture compliance reviews, and testing/integration phase support with the Business staff.

The completed work packages are deployed on the QA instances for stakeholder demonstration, testing, and feedback. Work packages that need changes are operated in the daily sprints and redeployed to the staging instances. The work packages are listed as deliverables and staged for further testing and validation.

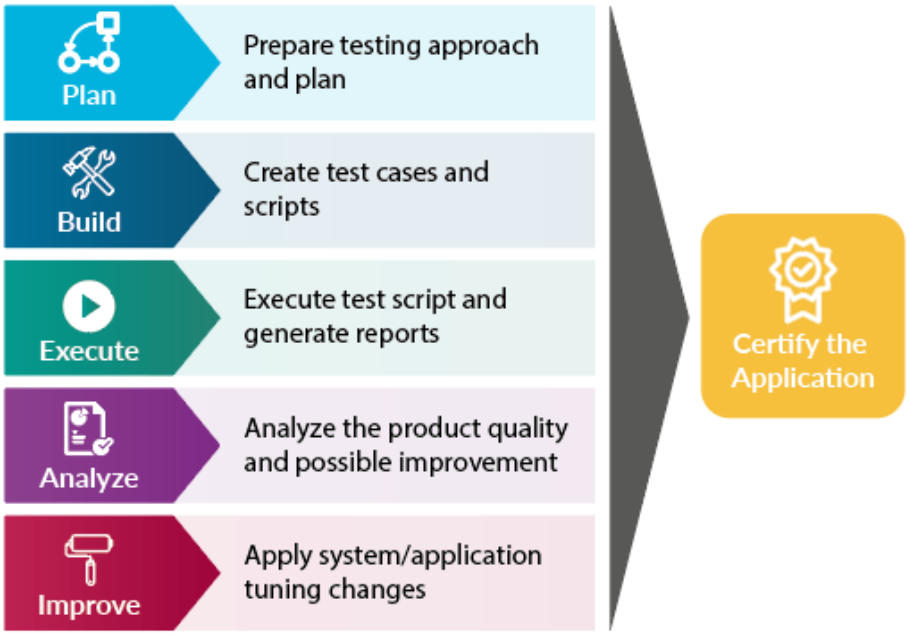
User Acceptance Testing (UAT)

The testing will undergo the life cycle of its own. Each Sprint under goes testing life cycle after its development phase is complete. The cycle also includes performance analysis and application tuning for better throughput.

The quality KPI's will be measured using the following metrics:

- Requirements traceability percentage
- Test coverage percentage
- S-curve (for defects)
- Root cause categorization

User Acceptance Testing (UAT)

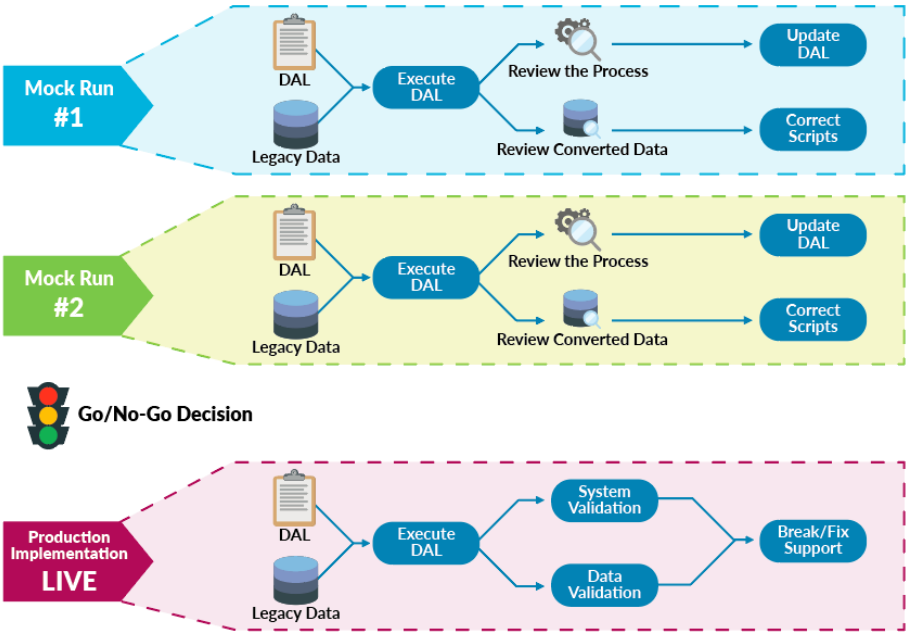


Implementation and Support

An Implementation Plan or Detailed Activity List (DAL) will be prepared for implementation.

The DAL will be executed at least two times before it is executed in production. These are termed as 'mock runs'. During the mock runs, the system will be validated for any implementation and data conversion issues.

Implementation



Development Standards

Team SSTech will adopt the Authority's processes and methodologies. All documents will follow Authority defined templates. In case of a need to utilize a Team SSTech's procedures/templates, Team SSTech will seek necessary approvals from Contract Manager and adopt them.

Verification and Validation

All deliverables will undergo the review process before they are delivered to the Authority.

- **Peer Review:** This review will be done by the fellow team member of the project. This will ensure the project related items are documented completely and correctly.
- **SME Review:** This review will be done by the Team SSTech's SME pool. The SME pool is set of associates that help the Team SSTech owned projects deliver with good quality.

Team SSTech's review process for Requirement documents include – traceability of the meeting notes from the Requirements Planning sessions against the User Requirements documented. The process also ensures the categorization of the requirements (functional vs non-functional) is done correctly.

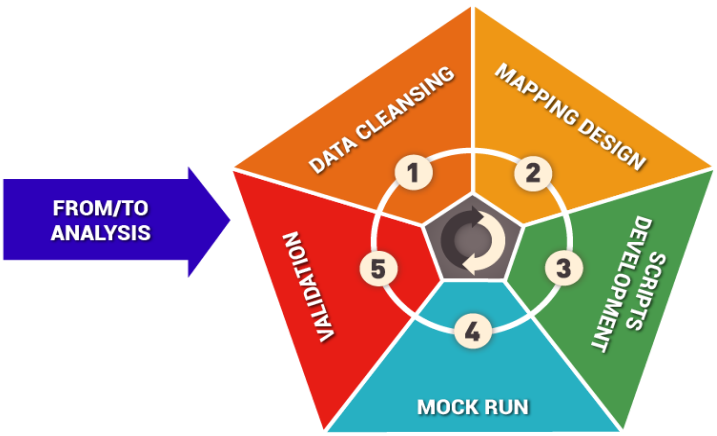
It is the responsibility of the Authority's Contract Manager to Sign-Off on the respective deliverables after validation is done by the concerned Business SME.

Data Conversion

Team SSTech Data Conversion expertise spans across multiple credit card platform conversions and due to that experience we have industrialized the data conversion process end-to-end.

Team SSTech's data conversion process (illustrated in the figure). These phases are repeated until the target data validation is approved by the client.

Data conversion process



From/To Analysis: Analyze the source and target data models and the respective data store formats and identify the conversion requirements.

Data Cleansing: Identify the orphan, redundant and incorrect data in the source system and avoid conversion of the same to new system.

Mapping Design: Design the conversion module to meet the data conversion and cleansing requirements. This include the source data communication channels.

Scripts Development: Develop scripts to meet the conversion requirements for both '*At-Rest*' and '*In-Transit*' data from source system to target system. Also, develop scripts for data validation on the target system after conversion.

Mock Run: Execute the scripts on the source data based on the data store format to convert into the target system data store.

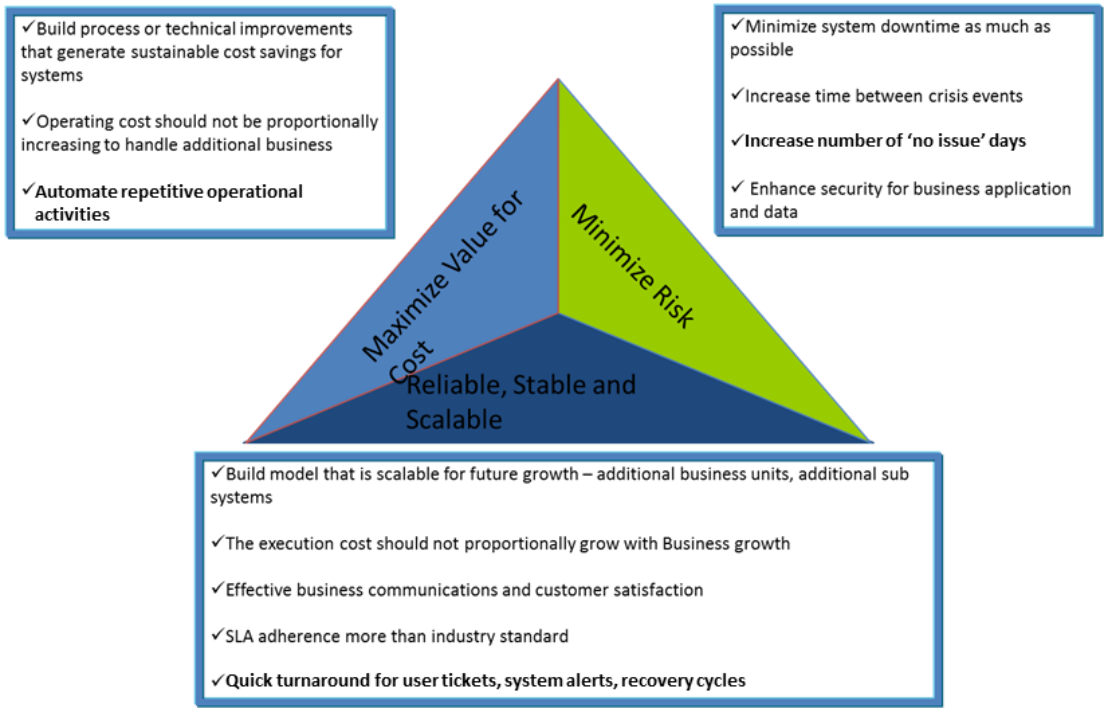
Validation: Validate the converted data by executing the validation scripts and reviewing the validation reports.

Managed Services

Team SSTech believes in value for cost, minimizing risk and improve system stability as part of the maintenance and support framework.

The proposed methodology provides an overview of the objective and activities against the high level goals.

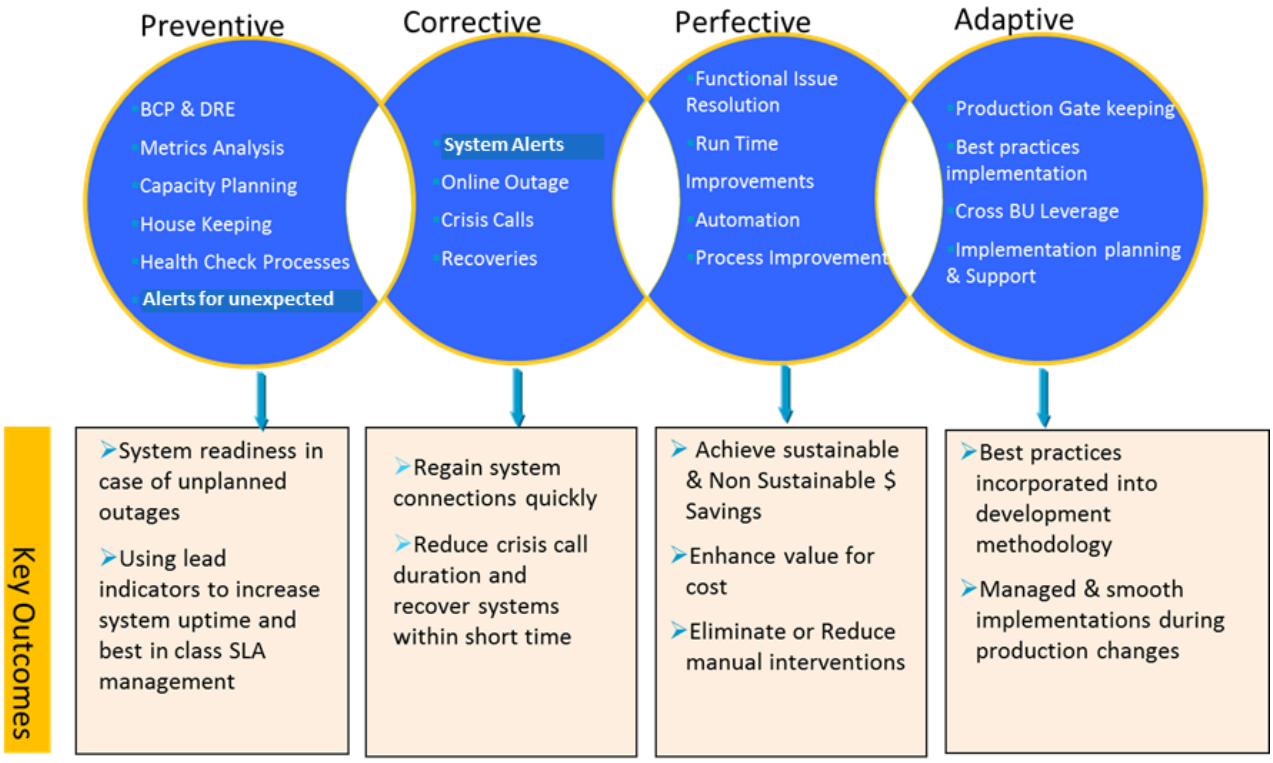
Proposed methodology



Continuous Improvement Methodology

Team SSTech continuous improvement methodology includes 4 stage process – *Preventive, Corrective, Perfective* and *Adaptive*.

1. **Preventive:**
   - All activities that we consider that are **MUST** to up-keep of the environments. All these activities are lights-on activities, i.e., actions taken during normal work days.
   - Proactive activities like monitoring (logs and alerts) , patching (security and bug fixes) are performed
   - Planning for the future growth and preparing for unforeseen events are crucial activities in this phase. For example: planning for disasters, having continuity of operations plan (COOP) and so on.
2. **Corrective:**
   - In this discipline we define all the steps that need to be taken when an unforeseen event (Incident) occurs
   - Fixing issues while minimizing downtime
   - Develop a root-cause analysis of the incident and coming up recommendations for a long term fix
3. **Perfective:**
   - In this discipline we identify all activities that resulted from earlier disciplines. Most of the activities in this discipline are **NICE** to have at a certain point but may later become **MUST.**
   - Apart from incorporating lesson learned this discipline identifies potential problem areas and provide solutions, for ex: Identify repeatable activities that are labor intensive and replace human interaction with automated tools.
4. **Adaptive:**
   - While the above disciplines an streamline the O&M activities, but does not provide scope to radically improve the business process
   - Adapt lesson learned by the industry
   - Introduce new technologies to improve TCO



Service Level Commitment

The following is Team SSTech's Service Level commitment to the Authority. All issues subject to prioritization and pre-evaluation.

Severity	Acknowlegdment Time	Resolution Time
Critical	2 Hours	1 Day
High	2 Hours	3 Days
Medium	2 Hours	5 Days
Low	2 Hours	10 Days

Project Management Methodology

Scope Management

All scope control requests will be submitted in writing to the Authority by Team SSTech in the Authority's provided format (after appropriately vetting the request with the Authority Project Manager and the key stakeholders). We understand that verbal requests will not be acknowledged or

accepted. The Authority reserves the right to request additional information when considering the requested scope.

In cases where a scope control necessitates changes to the Project Management Plan (PMP) and/or schedule, Team SSTech will post an updated version of the PMP and project schedule on the project SharePoint site, identifying any impacted project areas within three (3) business days of Authority notification of request approval.

In some cases, scope updates to the PMP and project schedule will be identified and reviewed as a part of the Change Control approval process. Changes to the PMP and/or project schedule will be reviewed and approved following the established approval process. Approved versions of the PMP will reflect a new version number, and the project schedule will be base lined. The revised/approved PMP and project schedule will be posted by Team SSTech on the Project SharePoint site in both MPP (MS Project) and PDF file formats.

Requirements Management

As the high level requirements are already collected and a high-level requirements document is available, the Requirements Management process will begin with tracking and managing the requirements. Detailed Requirements discovery will be carried out in this phase through user interviews and produced as the Detailed Requirements document.

Scope Baseline

The project scope defined in the RFQ document will serve as the scope of this project. The approval of this project plan will be considered as baseline for the defined scope. Any changes to the scope will undergo change request process and the project plan will be updated accordingly.

Requirements Traceability

The standard Authority template for requirements traceability will be used for tracking the requirements. All change requests will be tracked via the Change Request Tracker in the Configuration Management System (SharePoint).

Once the scope is baselined, prioritization of requirements will be done and the schedule derived.

Schedule Management

Team SSTech will follow industry standard project management process tailored to suit the Authority's needs. Once the contract is awarded, the PMI-certified Project Manager (PM) assigned by Team SSTech for this engagement will schedule a kick-off meeting that includes both Authority and Team SSTech teams. Team SSTech's project team will meet with the Authority to formally kick-off the project.

The agenda for this meeting will include the following topics:

- Team Introduction
- Team SSTech's approach to executing this project
- Project management methodology

- Project plan submitted during RFP stage and changes during contract negotiations (if any)
- High level requirements
- Deliverables list
- Team SSTech's communication plan for better information dissemination
- Team SSTech's project team structure and hierarchy
- Reporting structure, which includes weekly status reports, a milestone report, and bi-weekly/monthly executive reports

Team SSTech's PM will document all discussion points and action items. This will be made available in SharePoint or any other collaboration portal provided by the Authority team. Reports shared with the Authority's team will also be made available in this collaboration portal.

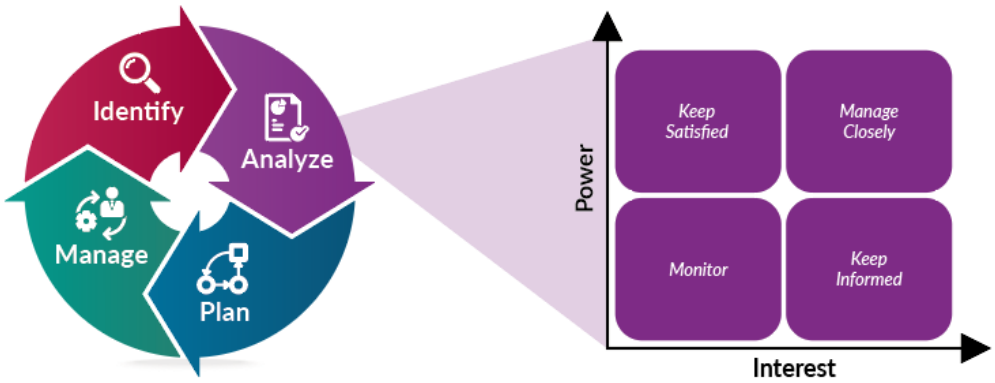
Stakeholder Management

PMI's Stakeholder Management process will be utilized (as depicted in the figure below) for managing stakeholders.

Team SSTech's PM will work with Authority contract manager or executive team to identify stakeholders, which consist of all (but is not limited to) business users, functional team, and subject matter experts (SMEs). Identification of stakeholders is repeated whenever there is a change in the project organization.

The PM will analyze the stakeholders' information by using the Power/Interest grid technique, in which a given stakeholder is mapped to a specific quadrant based on power and interest in the project. The PM will then prepare and execute the plan for managing the respective stakeholders.

Stakeholder management process



All Team SSTech deliverables will undergo review by Authority stakeholders as mentioned in the RFQ. Team SSTech team will address the comments given by Authority team and resubmit for review and approval.

The following list of deliverables will undergo Authority review before getting approved.

- Project management Plan
- Project Schedule
- Detailed Requirements
- Design document
- Technical Architecture
- Security Plan
- Data model and SQL
- Coding standards
- Code review request forms
- Test Plan, Test Scenarios and Test cases
- UAT scenarios and test cases
- Implementation plan
- Support Plan
- System documentation / Operations Manual
- Closure Documents (Lessons Learnt)

Project Change Management

Team SSTech's PM will monitor the project for any changes to the agreed Project Scope and Plan. Any such changes identified will undergo a Change Management Life Cycle as depicted in the figure on the next page.

All changes identified will be logged in the Change Log. The PM along with the Project team will perform a detailed impact analysis of the change, which include but not limited to Scope, Schedule, Cost and overall project objectives. A detailed document will be created and presented to the Change Control Board (identified during the Planning phase) for evaluation and approval. Only approved changes will result in changes to Project Plan, Scope and Schedule.

Change management process

Risk Management

Team Team SSTech understand that risk is an event or condition that, if it occurs, could have a positive or negative effect on a project's objectives. To handle the risk without affecting project objectives, Team SSTech developed Risk Management process of identifying, assessing, responding to, monitoring and controlling, and reporting risks. Team SSTech project manager working with clients, project team and project sponsors will ensure that risks are actively identified, analyzed, and managed throughout the life of the project. Risks will be identified as early as possible in the project to minimize their impact.

The PM will conduct bi-weekly Project Risk Review meetings to identify and assess the project risks. As part of this meeting, he will update the Risk Register with the current status of the risk and its

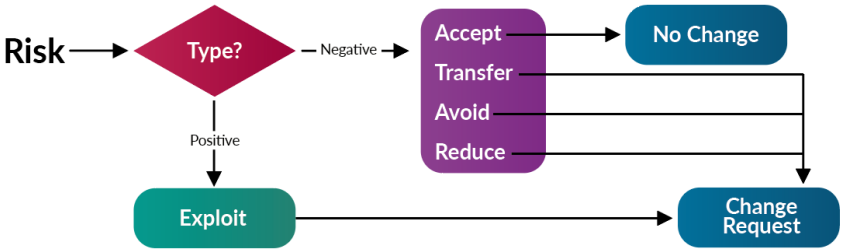
probability. He will then preform the SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis and add the details to the project status report. He will review these risks with the respective stakeholders and take necessary action (avoid, transfer, reduce or accept). If the action results in a change request, it will undergo through the Change Management process.

Team SSTech understands that there may be Positive Risks that benefit the project execution. The PM will record those as well in the Risk Register and ensure that they are evaluated and exploited for the best interest of the project.

The Quality Lead will perform Risk Audit every month to ensure that all the project risks are captured and managed.

Risk management process

Risk mitigation



Team SSTech will use the following risk register:

Risk register

Risk Identification						Qualitative Risk Assessment			Risk Response Plan				Monitoring and Control		
Risk ID	Risk Event	Cause	Effect	Status	Risk Category	Threat or Opportunity	Primary Objective	Probability	Impact	Risk Matrix	Response Strategy	Response Actions	Responsible Entity	Interval or Milestone Check	Status: Date and Review Comments

Issue Management

A Risk turns into an Issue when it occurs. An Issue Log is maintained and tracked for all such issues. As soon as the issue is identified/occurs, an entry in Issue Log is done and the respective stakeholders are notified of its occurrence. The PM along with the project team will immediately

analyze the root cause of the issue and derive the possible resolution. The resolution with be reviewed with the identified stakeholders. The resolution is implemented after stakeholders' approval.

Figure 1: Issue log template

SYSTEM SOFT TECHNOLOGIES

Issue Log

Sl. No	Status	Opening Date	Targeted Closure Da	Closure Date	Issue Description	Raised by	Severity of Impact	Risk Reference	Owner of the Issue	Proposed Solution / Action Items	Status Updates
1					Finding: XYZ Issue: XYZ Impact: XYZ						

Quality Management

Team SSTech's quality management process focuses on approach, activities, and roles and responsibilities necessary to maintain effective control over development and all critical work products produced during the project's life cycle. Quality management objectives are tracked by a series of reviews, audits, and measurements to determine whether the project's defined processes and work products meet or exceed quality expectations.

Team SSTech maintains the strongest possible commitment to quality in the provision of services in our contract. We pride ourselves on the delivery of products and services that are of a high quality. We understand that the use of Quality Management Systems as vehicles for the continued monitoring of the operations of an organization is of paramount importance in ensuring the delivery of high quality services.

The figure illustrates the key features of our Quality Management System.

Key features of Team SSTech's Quality Management System

The approach to Quality Control has the following characteristics:

- Collaborative development of clearly articulated goals and objectives and the associated performance metrics by which their attainment is measured
- Ensuring that our objectives are linked to customer needs and expectations
- Cooperative sharing of management responsibilities to resolve potential risks and issues, provide oversight, and maintain insight into day-to-day progress,
- Measuring customer satisfaction and acting on the results, and
- Development of an open communication environment based on mutual trust and unrestricted flow of information throughout the organization

Continuous improvement in the development project is achieved through following activities

- Analysis of project metrics
- Identifying improvement goals
- Deriving Corrective and preventive action implementation
- Delivery improvement Team actions

The Authority will provide the final satisfaction score and acceptance by formal post-delivery signoff.

Communication Management

The Team SSTech Project Manager will formulate a Communication Management Plan as part of the overall project plan. The plan will contains the following details.

- Stakeholders' communication requirement.
- Information related to language, content, format and level of detail.
- Person responsible for communication the information
- Time frame, frequency, reason and distribution list for project communication
- Escalation matrix and process of escalation are also part of the communication management plan.

The PM will ensure the project team is communicating as per the plan.

The communication within the project development team is through daily stand-up meetings and emails. The tasks will be communicated to the team through emails and project collaboration tool (Microsoft Team Foundation Server). Weekly status review meeting with Authority will be used for reporting progress on the project, milestones, discuss issues/risks if any. Configuration Management tool (SharePoint) will be used for communication on the functional requirements, for tracking the open issues and action items from meetings.

Daily Stand up meetings with the development team will be held to discuss the progress on a daily basis. The same will be conveyed to Authority in the weekly status reports and the weekly status review meetings.

The actions items out of any meeting between Team SSTech and Authority teams and the issues on the project will be tracked in Configuration Management System.

Resource Management

The Team SSTech PM is responsible for creating a project resource management plan, which will contain the details of the following.

- How and when project team members will be on-boarded
- Identification of training needs
- Plans for recognition and rewards
- Team building strategy
- Compliance considerations, safety issues,
- Criteria for releasing them from the project

Team SSTech's PM is the single point of contact for any resource related issues for this project. In case of any escalation, Authority can contact Team SSTech's Client Engagement Manager (details will be provided during kickoff).

Team SSTech believes in a collaborative work environment. The PM is responsible for the deliverables and team's performance. The PM ensures that the team is motivated and focused towards meeting the project objectives. The PM will constantly monitor team's performance and will take the necessary steps to avoid any impact to the project schedule and quality.

Any conflicts between the team members identified will undergo thorough analysis (for root cause) and resolved as soon as possible to avoid any impact on the project. Team SSTech believes in adopting "Problem Solving" technique to resolve conflict wherever possible.

7.1.23 (5.23) - Security Assessment

We are more than happy to comply with third party security Assessments. It is important to note that our Hosting Providers are regularly assessed, and information can be found easily on their webpages. Depending on the Hosting Provider ultimately selected (Google Cloud or AWS), specific security procedures may be shared directly.

7.1.24 (5.24) - Maintenance

The AW Platform is subject to the Service Level Agreements included in Appendix B, which outline all of the statistics for Availability, Security, Performance, Software Application Support, and Disaster Recovery.

Additional information on these topics can also be found in Appendix A in various articles such as *IT Service Management (ITSM), Disaster Recovery, Business Continuity Plan, and System Security Information*.

7.1.25 (5.25) - System Enhancements

Information regarding System Enhancements and Change requests can be found in Appendix A under *IT Service Management (ITSM)*.

7.1.26 (5.26) - Software Licensing Agreement

Enclosed is our sample End User Licensing Agreement. Any suggestions, changes, or modifications are open to discussion if down selected. All Maintenance agreements and standard are defined by the Service Level Agreements provided below in this document.

7.2 Proposed Timeline

The following chart represents the proposed timeline of the project.

Category	Start Date	End Date
User Management	05/01/2019	05/14/2019
Customer Dashboard	05/15/2019	05/28/2019
Education and Resource Management	05/29/2019	06/08/2019
Exemption Request Management	06/09/2019	06/22/2019
Engagement Activity Reporting	06/23/2019	07/05/2019
Good Cause Request Management	07/06/2019	07/19/2019
Documentation and Notification Management	07/20/2019	07/30/2019
Data Exchange Management	07/31/2019	08/13/2019

7.3 Scope of Work

The following Work Plan presents a listing of the tasks and activities that must be performed to deliver all the work specified in the RFP.

Category	Task Description
User Management	*The solution includes full functionality for User Management, which meets the needs defined in the Scope of Work outlined in the RFP.* *The solution allows for the creation, editing, and deletion of user accounts with system access granted via username/password requirements. The solution*

	supports the creation of role-based user Profiles and user Groups based on the needs of those individuals and groups within the system and as agreed upon during the requirements gathering process. The assignment of roles ensures that accesses and permissions within the system are granted only to appropriate users. Restrictions may include access to specific fields, forms, documents, and other data. Authorized users have the ability to create, edit, and manage the values and fields of various functions within the solution. *Roles include guest users (no login access), non-customers, AW program participants, Assistors, Portal Customer Service, PEV workers a AHCCCS and DES, and system administrators. System accessibility is based on defined and assigned user roles. For example, guest users without a login can access Resources, Educational Materials, Arizona Works Help functions, Arizona Works FAQs. Non-customers can get help with account creation and password resets. AW program participants can create one account per person with a username and password to access their personal participant portal and related fields. The System Administrator(s) has full administrative rights and can assign roles, permissions, and administrative privileges to other users and user groups. System access is available through various devices such as smartphones, tablets, and computers and includes full security/identity management features.* *The system supports multilingual capability options, which will be determined during requirements gathering conversations and applied to the deployed system, and is fully ADA compliant.* *All data regarding secure access, users, user groups, roles, permissions, and privileges is compiled into the database, which can be searched, filtered, exported, and reported on by staff using the standard Application toolset.* *Completion of this Sprint will be demonstrated by providing screenshots or an instructional video of the above described functionality.*
Customer Dashboard	*The solution includes full functionality for the configuration of the Customer Dashboard, which meets the needs defined in the Scope of work outlined in the RFP. The base solution may be configured as defined by the the Program during requirements gathering conversations. Any aspect of the standard processing workflows may be altered prior to deployment, or post-deployment by internal business users.* *Customer Dashboard functionality includes a set of fields and settings to allow AW customers to perform needed tasks and access program resources. Through the dashboard, customers can provide needed information and documentation that is material to the customer's eligibility in the AW program such as needed proof for an exemption from requirements (Good Cause). Customers can upload or email pertinent documentation and information, report completed activities, find and view educational resources, and access AW help features and FAQs.*

	All fields and data collected in the Customer Dashboard is assigned a unique identifier and is compiled into the database, which can be searched, filtered, exported, and reported on by staff using the standard solution toolset. *Completion of this Sprint will be demonstrated by providing screenshots or an instructional video of the above-described functionality.*
Education and Resource Management	*The solution includes full functionality for Education and Resource management, which meets the needs defined in the Scope of work outlined in the RFP. The base solution may be configured as defined by the the Program during requirements gathering conversations. Any aspect of the standard processing workflows may be altered prior to deployment, or post-deployment by internal business users.* *Education and resource functionality includes the ability for the State to maintain educational materials in standard formats as well as link to other systems. The management of resource materials includes broadcasting information regarding resource availability such as computer resources by location and relevant web pages. The State can update content and add resource links. Site administrators can create and collect data from surveys. Videos can be embedded into the system when needed.* *All education and resource elements are assigned a unique identifier and is compiled into the database, which can be searched, filtered, exported, and reported on by staff using the standard solution toolset.* *Completion of this Sprint will be demonstrated by providing screenshots or an instructional video of the above-described functionality.*
Exemption Request Management	*The solution includes full functionality for the management of Exemption Requests, which meets the needs defined in the Scope of work outlined in the RFP. The base solution may be configured as defined by the the Program during requirements gathering conversations. Any aspect of the standard processing workflows may be altered prior to deployment, or post-deployment by internal business users.* *The AW platform manages and tracks requests for exemptions to the program that are made by participants. Exemptions require the requestor to provide specific and detailed information regarding the reason and circumstances of the exemption request. The exemption management process allows the requestor to complete all required information, upload related documents, and edit, change, and delete requests. The system allows for multiple exemptions to be requested simultaneously. The system is configured to indicate if the request is approved or denied, reasons for denial, and if additional information is needed. The system is linked to the eligibility and enrollment (HEAplus) system, which can be accessed when the exception request is related to HEAplus.*

	All data related to the Exemption process is assigned a unique identifier and is compiled into the database, which can be searched, filtered, exported, and reported on by staff using the standard solution toolset. *Completion of this Sprint will be demonstrated by providing screenshots or an instructional video of the above-described functionality.*
Engagement Activity Reporting	*The solution includes full functionality for Engagement Activity Reporting, which meets the needs defined in the Scope of work outlined in the RFP. The base solution may be configured as defined by the the Program during requirements gathering conversations. Any aspect of the standard processing workflows may be altered prior to deployment, or post-deployment by internal business users.* *As part of the eligibility and enrollment requirements, customers must report engagement activities in the AW platform. Activity tracking is based on a Reporting Month, during which certain and specific requirements must be met in the absence of an exemption. The Engagement Activity Reporting functionality includes a set of predetermined data fields to be completed by the customer and related to activities such as volunteer activities, school enrollment/attendance, classes on Life Skills and Health Education, Job Readiness activities, and Job Search activities, and part time work activities that amount to less than the reporting month requirement.* *Reported activities are tracked to determine whether the reporting month hourly requirement is met or not met. Program eligibility is linked to the completion of the required hours during the reporting month and workflows built into the system are triggered by the participant's completion or failure to complete the required activity hours.* *All data related to reported activities is assigned a unique identifier and is compiled into the database, which can be searched, filtered, exported, and reported on by staff using the standard solution toolset.* *Completion of this Sprint will be demonstrated by providing screenshots or an instructional video of the above-described functionality.*
Good Cause Request Management	*The solution includes full functionality for the management of Good Cause Request data, which meets the needs defined in the Scope of work outlined in the RFP. The base solution may be configured as defined by the the Program during requirements gathering conversations. Any aspect of the standard processing workflows may be altered prior to deployment, or post-deployment by internal business users.* *As part of the hourly eligibility requirement of hours per reporting month, during the last 5 days of a reporting month customers can report "good cause" as to why the monthly hourly requirement has not been met for a reporting month. The Good Cause functionality includes a set of predetermined data fields to be completed by the customer outlining why the hourly requirement was not met. Reasons can be related to severe weather occurrences, a family emergency*

	or life-changing event, or illness of the customer or a household family member. The portal is accessible by state workers to process requests and determine eligibility. Customers are notified of the results of the determination. Workflows configured into the system determine the next steps for the participant based on the outcome of the Good Cause review. *All data related to Good Cause activities is assigned a unique identifier and is compiled into the database, which can be searched, filtered, exported, and reported on by staff using the standard solution toolset.* *Completion of this Sprint will be demonstrated by providing screenshots or an instructional video of the above-described functionality.*
Documentation and Notification Management	*The solution includes full functionality for Document and Notification Management, which meets the needs defined in the Scope of work outlined in the RFP. The base solution may be configured as defined by the County during requirements gathering conversations. Any aspect of the standard processing workflows may be altered prior to deployment, or post-deployment by internal business users.* *The solution's base functionality includes document management functionality such as importing and exporting documents in standard file formats within the system, assigning documents to records, incidents, personnel, etc., a document/knowledge library; the ability to create, edit and delete documents based on user roles; version control; and adding tags and metadata.* *The solution includes the communication and notification functionality needed to meet the AW program's requirements. Notifications can be sent via email or directly from the user interface. The solution includes workflow functionality to allow users to send automatic notifications based on configured trigger events, such as the receipt of documentation or data inputs, missing or incomplete information, and determinations on requests for exemptions, good cause, etc.* *All documents and notifications are assigned a unique identifier and are compiled into the database which can be searched, filtered, exported, and reported on by staff using the standard solution toolset.* *Completion of this Sprint will be demonstrated by providing screenshots or an instructional video of the above-described functionality.*

7.3.1 All Scope of Work tasks include the following:

Create the complete Data Model with CRUD functionality Developer will modify Tables, Fields and Relationships for the Feature Set. In addition, Developer will verify that full Create, Read, Update and Delete (CRUD) functionality is available for all records in the data model.
Key Screens, Dashboard and Wizard Frames Developer will work through each Key Search, View/Edit and Add Page, modifying as appropriate to include functional layout changes, addition of Calendars and to include addition of other interactive elements to the Page. Developer will then frame in any Dashboards and Wizards as needed.
Calculations, Workflow, Wizards Developer will configure all Feature Set logic layer features including calculations, workflow or wizard components. Developer will supplement with additional data or presentation layer modification as needed to complete the automation.
Dashboards, On Demand Reporting and Automated Report Delivery Developer will configure on screen and delivered Feature Set reports including the configuration of delivery schedules.
Testing Developer will remediate all in-scope reports from the Testing team.

8. EXPERIENCE, EXPERTISE, AND KEY PERSONNEL

8.1 Client References

Project	Description
Organization Name & Address	Magna International 375 Magna Dr Aurora, Ontario L4G 7L6, Canada
Contact Information	Dr. Arif Bhimji 1 905 726 2462
Project Title	Magna International Health and Wellness portal
Project Start/ End Dates	1/2016 - Currently Engaged
Brief Project Description	Large internal Health and Wellness portal for approximately 168,000 employees. CitizenDeveloper designed and deployed this internal application in a fraction of the time and cost of a traditional portal development, by using our industry-leading toolsets. The system supports Health improvement plans, goal tracking, assessments, and employee participation logs, while providing PII protection to all internal data. Currently supported through a CitizenDeveloper Support model, the application is maintained and updated with minimal input from Magna.

Project	Description
Organization Name & Address	Federal/State Reimbursement Management for Texas Agencies Subcontractor to T&G Medical Billing 1204 Jasmine Ln Longview, TX 75604
Contact Information	Ted Smith, Owner 903-295-1586 tedsmith@cablelynx.com
Project Title	Med Claim Xpress
Project Start/ End Dates	01/2014 – 07/2014
Brief Project Description	T&G Medical Billing's application is a BPM/SaaS solution used for dozens of public sector agencies throughout the state of Texas to help them maximize their recovery of federal SHARS program dollars. This application allows for Service Providers to manage information about special education sessions they have provided to specific students, as well as solicit approval from supervisory personnel. Each month, EDI batches are defined, automatically delivered, and tracked by District Administrators for final review and escalation. Once approved, Application Administrators can submit these EDI batches directly to the Federal SHARS program. Throughout this process, each user can generate reports that summarize total session details, district wide information, and Application level reports, as well as related billing Items.

Project	Description
Organization Name & Address	PA Department of Community and Economic Development 400 North Street Harrisburg, PA 17120
Contact Information	Andrew Sheaf asheaf@pa.gov

Project Title	Municipality Financial Reporting Portal
Project Dates	04/5/2018 - Currently under Contract
Brief Project Description	Providing a SaaS Application that highlights financial distress factors for a municipality in Pennsylvania, based on the metrics that municipalities are required to report to the commonwealth. The Application ranks municipalities according to their level of distress by calculating various data points and trends, which then allows the administrator to assign weights to each of these metrics, resulting in a model template that can be applied to municipalities of different classifications.

Project	Description
Organization Name & Address	CaseGlide
Contact Information	Carly Cohen (877) 608 – 8591 carly@caseglide.com
Project Title	Litigation Analytics/Database Software Development
Project Dates	January 2017 - ongoing

Brief Project Description	The CaseGlide Insurance Case Management software was designed and developed ground up. This application caters to the needs of Insurance companies in managing the Claims related case management in collaboration with law firms. This is a SaaS offering by CaseGlide for its clients and as such requires deep configurability and high degree of developer independence in being able to define new fields, screens, searches and reports to be able to cater to the varying and time critical changes of individual clients. As such we built the entire data model to be dependent on dynamic fields, application model to be fully RESTful services that can be setup on a specific machine and can be independently scaled and utilization of many accelerators such as Dynamic Field Validations, Dynamic UI (Form Builder), Dynamic Reports, Search etc., to make the application very configurable and flexible. This makes sure that there is very little developer involvement needed when new fields need to be added to the data model, thereby reducing time-to-market heavily. Additionally the data model lends itself to scale the application both vertically and more specifically horizontally as the data store can be shared between multiple tenants as long as the data volumes allow and if the data grows too much for vertical scaling, then the data can be separated out into different databases specific to the tenant and can be horizontally scaled without a huge time loss. The scope of the project is to build CaseGlide as a Case/Claim Management Application which helps the Insurance Companies and the Law Firms to collaborate, review and maintain claim details. The application empowers the Insurance Companies to record and track the claims and ensure effective data compliance. The primary users of this application are Case Managers and Attorneys. As soon as the claim is reported, the Insurance Company creates a new case in the application which includes Claim details and Plaintiff details. A Case Manager is assigned to the case and he/she will manage the case till its closure. The details of the attorneys working on the case are also captured. All the parties involved in the case – Case Manager, Attorney, Insurance Company, Law Firm are provided with necessary access to update the case details throughout the life cycle of the case. The Insurance Company is the owner of the case data and will control the access and data visibility to the involved parties.

8.3 Key Personnel

Venkata Uday Tumma – Project Manager	
Education and Certifications	▪ Master of Technology(M.Tech) in Computer Sciences, Osmania University, 2002 ▪ Master of Sciences (M.Sc) in Computer Sciences, Kakatiya University, 2000 ▪ Project Management Professional (PMP) ▪ Engagement Management Certification from Capgemini ▪ Leadership Academy Training (Banking Industry SME) in Capgemini ▪ Solution Architect Training (Cards) in Capgemini ▪ TOGAF 9

Management Expertise

- Have led a team of 60 members
- Have managed projects which include conception, estimation, analysis, development, testing, implementation and post-implementation activities.
- Have been playing Client facing roles for 11 years
- Have executed projects in both waterfall and agile methodologies

Work Experience

Project Manager / Solution Architect

Enterprise Solution System, System Soft Technologies Florida, US (2014 – Present)

This Web-Based application is one stop solution for all enterprise needs. The application includes 12 modules which specialize in their respective enterprise functions including Asset Management, Sales Management, Human Resources Management, Finance Management and Documents Management. The application is designed to support functions for all its users (Clients, employees and support staff). The modules are designed using Service Oriented Architecture principles. After successful authentication, the service requested will be served by the respective module. Each modules owns related data and is structured for easy access.

Project Manager / Technical Lead

HSBC Software House, Capgemini Florida, US (2003 - 2013)

HSBC has migrated 13 of their Cards processing systems to OneHSBC application. The OneHSBC application is HSBC customized version of Vision Plus product developed by FDI. The project is to ensure the live systems are running without any outage due to system anomalies and also correct the system for any defective functionalities identified by business users. Also, every credit card system should comply with Visa/Mastercard/Amex mandates (Compliance) that are released twice a year. The project is to ensure smoother upgrade of the existing live systems. This involves analyze the FDI code release, retrofit, test and production implementation.

Drew McLain - Primary Developer			
Education	Kutztown University, Kutztown, PA, 2001 B.S. in Computer and Information Science		
Years of Experience	16+ years		
Title	Software Engineer	Project Role	Primary Developer

Relevant Experience

Co-Designer of WorkXpress and CitizenDeveloper, no-code development PaaS platforms designed to allow an average employee with little to no programming experience the ability to design and develop robust, database-driven business applications.

Pioneered an actions system that allows users to create, delete, and update records and relationships, evaluate field values, and include branching logic (if/then/else and switch) automate communications and responses, queued actions, integrate third party systems through API calls, and much more.

15+ years of experience throughout lifecycle of development. Proficient in role as architect, front and back end developer in multiple technology stacks, network engineer, IT services, Google Apps/Email management, infrastructure services, hosting automation, and direct Client interactions.

Proficient in both Agile and Scrum methodologies, and management of a team ranging from 2-30 members through development and launch of 600+ applications.

Management Competencies

16+ years' experience as Primary Application Development Trainer.

15+ years' experience managing project scheduling and deliverables for both internal and external development projects.

16+ years of extensive strategic planning experience in establishing long range plans and projected technology trends.

Technology Competencies

16+ years' experience with PHP, CSS, RESTful, SOAP, XML/DTD/XPATH, JSON, HTML5/DOM and proficient with JavaScript, Node, React, Flux.js, Angular.js.

14+ years' experience with jQuery, MySQL, Google Compute Engine. Highly Proficient with Neo4J/Cypher, MongoDB, MS SQL.

14+ years' experience with Ubuntu Linux, Apache, OO, DNS, VMWare ESXi. Highly Proficient with Containerized Microservices, Docker, Amazon AWS/S3/Route53, Git, Docker Hub/Cloud, Kubernetes.

Work Experience

Software Engineer, CitizenDeveloper, Harrisburg, PA (May 2002 to present)

Responsible for the development and launch of world's first 5GL platform, allowing business users to develop sophisticated business applications without writing code.

Front end elements (forms and fields) coupled with Tables, Records, Relationships, and Actions are driven from an intuitive drag and drop web interface.
Primary engineering developer for hundreds of integrations including Google Apps PhoneGap, and Braintree web services.
Senior Programmer, Interactive Services Group (ISG), Delran, NJ. (December 2003 to December 2004)

Alex Liffick - System Administrator			
Certifications	MCP+I and MCSE Windows NT Server and Workstation Administration Sun Solaris Installing and Maintaining SQL Server 2008 R2 CCNAX		
Years of Experience	18+ years		
Title	Systems Administrator	Project Role	Systems Administrator

Relevant Experience

Systems Administration: 16+ years of experience in server side administration, including building, maintaining, and management of server side Architecture and environments.

IT subject matter expert: A professional with over 18 years' experience providing technical and management expertise in Hosting environments and Database management. Focused on security, scalability, compliance, and efficiency.

Successfully built and maintained server environments using multiple technology stacks, including Oracle, MySQL, MSSQL Database Servers, Apache, Nginix, and Microsoft IIS. Proficient in Linux Operating System, Unix, FreeBSD, Sun Solaris, Windows Server, Cisco IOS, MacOS X.

Technology Competencies

12+ years' experience with Linux, Unix, FreeBSD, Sun Solaris, Windows Server, Cisco IOS, MacOSX.

16+ years' experience with Oracle MySQL, MSSQL Database Servers, Apache Web Server, Nginx, Microsoft IIS and Exchange, NFS, NIS SMB File Sharing, Bind DNS, Docker environment (Kubernetes, Docker Swarm, and Caucho Resin Java Application Server.

16+ years of experience with programming languages: Perl, Python, PHP, Unix Shell, SQL, Oracle PL/SQL, Microsoft T-SQL.

Work Experience

Cloud Systems Engineer, CitizenDeveloper, Harrisburg, PA (May 2016 to present)

Responsible for building, configure, and maintenance of Ubuntu Linux Servers in LAMP environment, maintaining existing administration utilities.

Primary Responsibility to Develop and build Linux container environments for cloud applications, mainly using Google technologies.

Sr SQL Programmer/DB Administrator, PerformCare, Harrisburg, PA. June 2010 April 2016.

Director of IT / Systems Administrator, Pennsylvania State Nurses Association, Harrisburg, PA. June 2009 to June 2010.

Database analyst / Systems Administrator, Knowledge Planet (Mzinga) March 2005 to April 2009.

Master Web Hosting Technician / Systems Admin, Earthlink, Inc, February 2000 to January 2005

Noah Coburn - Software Designer			
Education	Liberty University, Lynchburg, VA (2007) B.S. in Mathematics, Summa Cum Laude		
Years of Experience	9+ years		
Title	Senior Developer	Project Role	Application Designer

Relevant Experience

Oversight of Development team responsible for approximately 75 deployments of fully featured web applications, with an emphasis on State and Government compliance.

8+ years designing and implementing complex third party integrations using SOAP, REST, and XML protocols.

Primary Developer for multi-state management platform based on multiple complex integrations and data management.

Information technology subject matter expert: A Bausch & Lomb Science Award winner, with 9 years of experience using PHP, C++, Java, HTML, CSS, and MySQL.

Primary contributor to driving success of CitizenDeveloper's development projects for 8+ years, responsible for implementing Agile-based approach.

Mastered actuarial exams P and FM.

Technology Competencies

8+ years of Design Experience, contributing to the successful technical design and architecture for 150+ applications.

9+ years' experience with PHP, C++, Java.

9+ years' leading professional teams tasked with application Design, Development, and Testing.

9+ years of experience utilizing HTML, MySQL, and CSS.

Work Experience

Senior Developer, CitizenDeveloper. Harrisburg, PA (October 2008 to Present)

Implementation of Agile Based internal project management system.

Primary Driver of direct customer level Support.

Primary Designer on enterprise level applications for multiple businesses, including Fortune 500 Clients.

Primary manager of dedicated team of developers, designers, and support staff, including named-level support for Clients.

9. PRICING SCHEDULE

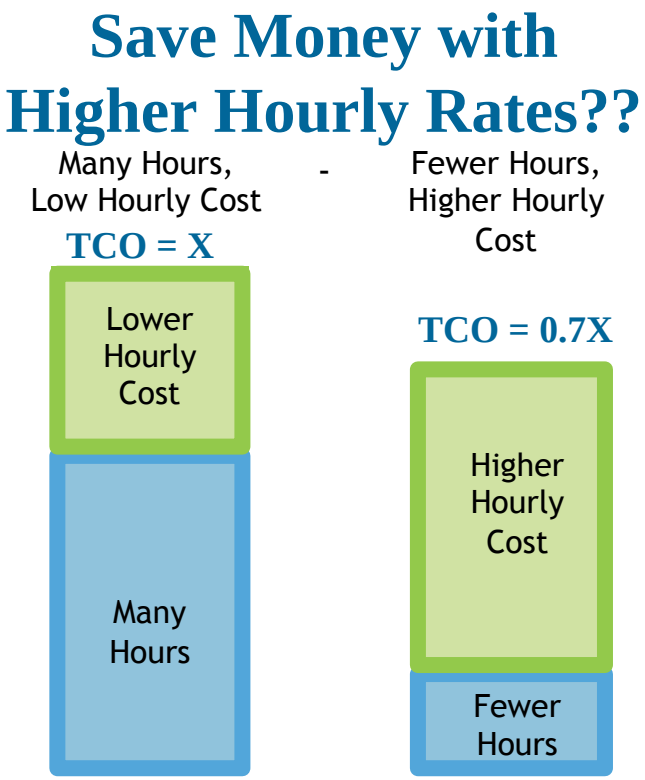
9.1 A Word About Pricing

9.1.1 Per Hour Costs - Do They Matter?

The hourly rate of software development ONLY MATTERS WHEN THE COMPETITORS ARE SIMILAR!!

9.1.2 What Happens When One Competitor Only Needs 10% of the Hours??

Software is often priced by per-hour cost models, based on standards of production widely accepted in the software market. CitizenDeveloper changes this model, through the use of our platform, achieving massive efficiency gains over a traditional software development environment.



9.1.3 Don't be Penny-Smart, Dollar-Foolish

Because our team is deploying applications based on the CitizenDeveloper platform, an individual on our team is able to produce 7x to 10x the number of features per hour versus a traditional developer. Through the use of drag and drop interfaces, dragging logic blocks, connecting workflows, as well as through the use of world-first Natural Language Development Tools, configuring a solution specifically to meet the needs of AHCCCS is completed in a fraction of the time of a standard development undertaking.

All code for the platform is generated (and Unit Tested!) outside of the hours you are purchasing - this means that for every hour of our time you purchase, you are getting as much as several additional hours "behind the scenes" - all as a part of our normal operations that applies to all of our customers. This "economy of scale" means that there are no code vulnerabilities, compliances are built-in, and the need for time consuming and expensive unit testing for basic functions and for security ***are all but eliminated from your hours budget***.

> *In fact, one of our team members is commonly 700+% more effective than a traditional developer on an hours per feature basis.*

9.1.4 How This Enhances Your Proposal

Faster Deployment - Because our team and toolset is so efficient, total timeframes of your deployment may be significantly shorter than expected - this is not a mistake. Of course, we can always accommodate slower time frames if you require them...

Faster Enhancements - within budget - Changes happen in software, it comes with the territory. In a traditional development model, even small changes can become a significant barrier, being expensive, time consuming, and seemingly never-ending. Not the case with CitizenDeveloper! With a 7x modifier to our efficiency, a 500 hour change order could be deployed in less than 2 weeks!

Project Success Rates - whereas studies show that traditional solutions - the ones you are likely considering right now - have a low likelihood of success, our ability to rapidly produce features allows us to boast a very high success rate across many hundreds of proposals like yours.

Reduced Total Cost of Ownership - Even IF our hourly rate is marginally higher, our total hours required is orders of magnitude lower. Your initial costs will be lower, and your ongoing costs will be lower. But most importantly, you will get far more features per dollar spent!

No Outsourcing of Labor - Because of the capabilities of the CitizenDeveloper Platform, there is no need to cut labor costs by outsourcing labor overseas. Our team is 100% US based.

Use of the CitizenDeveloper tools - Not only does this proposal include the configuration, deployment, and maintenance for your AW Portal, but you also receive access to the CitizenDeveloper toolset. No longer is there a reliance on IT departments to make changes or modifications, or even Vendor Lock-in - your business level users have the ability to make significant changes, modifications, or even brand new functions to your software!

9.1.5 Bottom line

Pricing per hour can become a black hole of cost burden in a standard development project. Our team is committed to delivering your fully tested and production ready software, in less time than any of our competition, and has a long history of proven methods.

Independent, third-party research has determined that 1 hour of our team's time is worth 7-10 hours of a traditional developer.

Our deployment time for 1000+ delivered applications is measured in weeks, not months or years.

Our team delivers finished products at a cost that is typically lower than our competition, through the use of our next-generation platform.

> *Choose us - you will be successful, on-time, and on budget, period.*

9.2 Pricing Overview

The completed pricing sheet is attached in the subsequent pages.

SOLICITATION # YH19-0028

AHCCCS WORKS PORTAL

ATTACHMENT A: PRICING PROPOSAL WORKSHEET

OFFEROR NAME:	**System Soft Technologies**

Total System Cost Summaries		
This will be the Total Cost Summaries from each of the Tabs in this spreadsheet		
Description	**One Time Costs**	**Year 1 Costs**
Software Costs	$ -	$ 100,000.00
Implementation Costs	$ 425,360.00	na
	$ 425,360.00	$ 100,000.00

Cost of Ownership: $ 525,360.00

SOLICITATION # YH19-0028

AHCCCS WORKS PORTAL

SOFTWARE PRICING

Provide a line item for all software costs of the proposed solution (if applicable).

Description	Qty	Unit Cost	Total One Time Cost	Yearly Maintenance Cost
Subscription Pricing (if applicable)	0	$ -	$ -	$ -
Hosting Fees (if applicable)	1			$ 25,000.00
License Fees (if applicable)	1		$ -	$ 75,000.00
Other			$ -	$ -
			$ -	$ -
			$ -	$ -
			$ -	$ -
			$ -	$ -
		Total Cost:	$ -	$ 100,000.00

SOLICITATION # YH19-0028

AHCCCS WORKS PORTAL

IMPLEMENTATION PRICING

Provide a line item for all implementation costs.			
Description	**COST**	**Duration* (days)**	**Total Project Run**
Process Analysis and System Requirements	$ 58,200.00	30	30
System Design	$ 98,760.00	90	120
System Development	$ 135,800.00	90	210
State Integration Testing and Evaluation	$ 50,400.00	90	300
Implementation	$ 51,600.00	10	310
Go Live	$ 30,600.00	0	310
Post Implementation Support**	$ -	90	400
**Post Implementation Support is included in Annual O&M costs	$ -		
	$ -		
	$ -		
	$ -		
Total Cost:	$ 425,360.00		

Implementation Costs shall include all travel.

***Projected Duration Supplied by the State is able to be followed, however, our tools allow for much quicker implementation timeframes as detailed in our proposal**

SOLICITATION # YH19-0028
AHCCCS Works Portal

IMPLEMENTATION DELIVERABLES

Deliverable	# of Staff & Titles	Hourly Rate	# of Hours
1. Business process analysis and system requirements document (Deliverable within 30 days from contract start date)	Senior Manager - 1, Program/Systems Analyst - 1		
a. Baseline Review (includes Project Start-Up along with Administrative and Baseline Reviews)	Senior Manager - 1 Program/Systems Analyst - 1	$225 $140	80 80
b. System Security Assessment	System Administrator	$100	80
c. Data/System Security Plan	Security Specialist - 1	$105	25
d. Data Use/Exchange Interconnection Security Agreement	Security Specialist - 1	$105	25
e. Risk Assessment Plan	Security Specialist - 1	$105	25
f. Complete Privacy Impact Analysis (PIA), System Security Plan (SSP) and Information Security Risk Assessment (ISRA)	Security Specialist - 1	$105	80
2. System Design (Deliverable 90 days from System Requirements Document Acceptance)	Data Architect - 1 Project Coordinator - 1 Program/Systems Analyst - 1		
a. Interface Design/Control document.	Data Architect - 1 Project Manager - 1 Program/Systems Analyst - 1	$120 $85 $140	60 60 60
b. Architecture walkthrough and requirements analysis	Data Architect - 1 Project Manager - 1 Program/Systems Analyst - 1	$120 $85 $140	60 60 60
c. Database design	Data Architect - 1 Project Manager - 1 Program/Systems Analyst - 1	$120 $85 $140	60 60 60
d. Detailed Design Review (includes Preliminary and Detailed Design Reviews)	Data Architect - 1 Project Manager - 1 Program/Systems Analyst - 1	$120 $85 $140	60 60 60

e. Final Detailed Design Review	Senior Manager - 1 Project Coordinator - 1 Program/Systems Analyst - 1 Primary Developer - 1 Data Architect - 1	$225 $85 $140 $95 $120	24 24 24 24 24
3. Development (Deliverable 90 days from Design Review Acceptance)			
a. Portals, for state worker access, customer enrollment/registration and reporting	Project Coordinator - 1 Primary Developer - 1 Developer - 1	$85 $95	500 500
b. User training plan (knowledge transfer, desktop manuals, on-site training)	Project Coordinator - 1 Primary Developer - 1 Developer - 1	$85 $95	100 100
c. Contingency Plan/Recovery Plan	Senior Manager - 1 Project Coordinator - 1 Primary Developer - 1 Developer - 1	$225 $85 $95	20 60 60
4. Testing and Evaluation (Deliverable 90 days from Design Review Acceptance)			
a. Test plan for functional, integration, system, regression and user acceptance testing	Project Coordinator - 1 Primary Developer - 1	$85 $95	60 60
b. Validation of test reporting	Project Coordinator - 1 Primary Developer - 1	$85 $95	160 160
c. Error reporting and remediation planning for test stages	Project Coordinator - 1 Primary Developer - 1	$85 $95	60 60
5. Implementation (Deliverable 10 days from Integrated Testing Acceptance)			
a. Implementation/Roll out plan to include dashboard reporting.	Project Coordinator - 1 Primary Developer - 1	$85 $95	40 40

b. Validated of production reports	Project Coordinator - 1 Primary Developer - 1	$85 $95	40 40
c. Ongoing error reporting	Project Coordinator - 1	$85	120
d. SLA agreements	Senior Manager	$225	120
6. Post Implementation (Deliverable 90 days from Integrated Testing Acceptance)			
a. Post implementation documentation delivery	Project Coordinator - 1	$85	120
b. Post implementation support/maintenance plan	Project Coordinator - 1	$85	120
c. Error reporting and remediation planning	Project Coordinator - 1	$85	120

9.3 Flat Rate Pricing

9.3.1 Flat Rate Licensing for the Enterprise

9.3.1.1 Common Licensing (scary!)

You are likely receiving many proposals with a Per-seat, Per-user, or Per-transaction cost. These options exist to provide advantages to the Vendor for future upsell opportunities. They provide you with an ability to scale your application, but at substantial costs that you frequently aren't budgeting for. When a future need arises, the only way to stay on budget is to accept severe limitations.

9.3.1.2 Proposed Licensing (flat rate)

We've included an Enterprise License in our proposal;

Transparent pricing, and

A model that you can budget and depend on even as you grow

9.3.1.3 How we are able to provide such a flexible model

Our proposed solution, the AW Portal, is designed from the ground up to be dynamically scalable in both pricing and performance. By using MicroServices and Asynchronous Processing, our software utilizes resources as needed, allowing your solution to scale according to a specific usage demand and without the traditional overhead of hardware and manpower needed for system optimization. This cost savings is passed to you through our Enterprise Licensing model.

9.3.2 What this means to you

Because the CitizenDeveloper platform is designed using cutting-edge Infrastructure, we don't have to build a model where user count or usage dominates cost consideration. With the proposed Enterprise License you receive:

Known Cost of Ownership - Prevent unknowns or budget revisions - a flat rate protects you from changes to your requirements.

Dynamically Scaling Hardware - Out of the box, your software automatically draws upon resources as needed to provide industry-leading performance but without the added cost

normally incurred by having "extra" hardware dedicated to peak times but underutilized at every other point through the day. Additionally, there is no need for your team (or ours) to manage hardware or monitor usage.

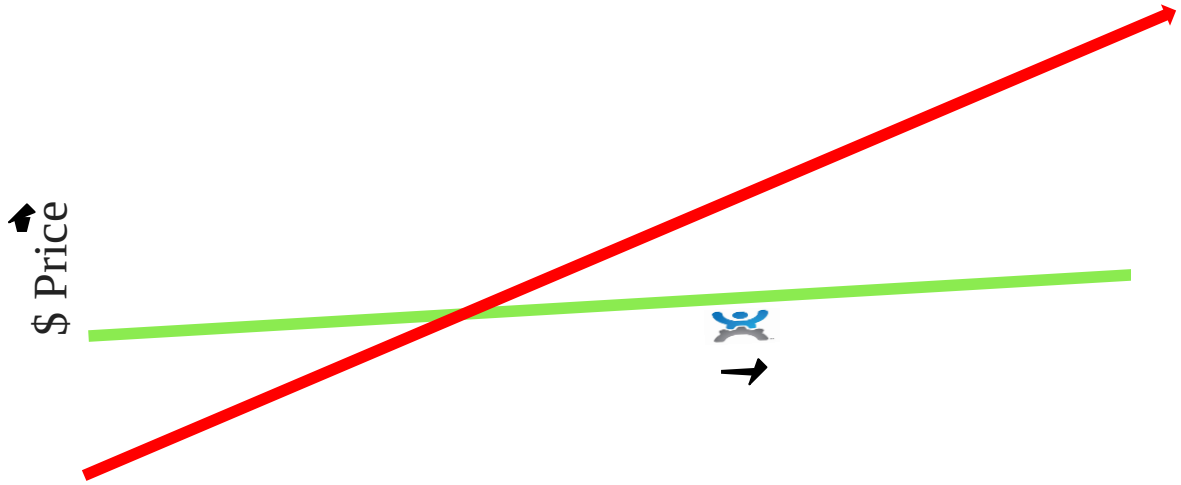
Unlimited Users - You'll never have to worry about managing a set number of licenses or sharing logins between users.

Many Applications - Scale the solution across your entire organization!

No Transaction Fees - Transaction fees such as per-use charges are built into the model - there is no need to invoice separately.

9.3.3 Bottom line - No handcuffs

We aren't going to place you in a model with handcuffs. Let's implement your software with a fixed budget that you can count on, and let's assume that your needs, staff, and/or usage will continue to grow:



10. TRAINING OVERVIEW

CitizenDeveloper has a proven training methodology that unifies training activities beginning with coordinated thought-through interfaces, moving to traditional concepts of in-application help and launching with onsite and train-the-trainer models, and concluding with appropriate help desk style support.

10.1.1 First Layer of Training - Proper Interface Design

The first line of defense for any training regimen is a well planned User Experience (UX). There are three basic user experiences that, properly designed, will significantly reduce the need for traditional training models:

10.1.1.1 Straight Line Interfaces

Most commonly deployed for infrequent users or consumers, straight line style UXs lead the user down a single path, stopping long enough at each and providing interfaces that are clear enough that the user can largely complete the task without significant additional assistance.

In this model, although there may be some need for domain-specific training, there should not be a need for software usage training. A great example of a straight-line interface is what is commonly described as a “wizard”.

10.1.1.2 Top-Down Interfaces (aka Progressive Disclosure)

This model follows the concepts of top down learning systems, and essentially distills out the highest level summary information on the first page. In this model, the user is free to drill down into areas of deeper interest, becoming exposed to increasing detail as they go.

Another common description of this model is “progressive disclosure”, meaning that each interface adds progressively additional detail such that the User can learn as they go. This model is typically best suited for internal infrequent or managerial users. A great example of this type of interface is commonly referred to as a “dashboard”.

10.1.1.3 Industrial/High Volume Interfaces

These interfaces presume some degree of training is not only available to the user, but likely is required. These interfaces are focused more on the productivity of a trained user than on ease of use without training, and are commonly supplemented by the third layer of training described below.

10.1.2 Second Layer of Training - In Application Knowledge Base

After producing great interfaces above, but prior to producing the requisite documentation and training material below, it is frequently advisable to produce most of the same training material but in a digital format available for consumption directly within the application. CitizenDeveloper, as a best practice, produces these digital materials either as dynamic content or as uploaded files, and in each case stores them dynamically in a "Help" or "Training" table. It then uses common interface elements such as the ubiquitous "question mark" to access the appropriately linked help content. Because this content is delivered using dynamic techniques, the application is free to grow and evolve with minimal impact on the time required to re-implement new training information.

Although help is not always required with straight line interfaces and top down interfaces application, it is common to use this method to provide domain-specific help to the end user.

10.1.3 Third Layer of Training - On Site

CitizenDeveloper provides a wide variety of On-Site and Train-the-Trainer models to supplement its first, second, and fourth layers of training.

Best practices for On-Site and Train-the-Trainer Meetings include:

- On-Site Training
- Multiple sessions, user-group focused
- Sessions done prior to rollout with live application training
- Side-by-Side help during rollout with expert working beside your staff
- Sessions done 30 and 60 days after rollout to address any staff questions or comments

Of course, a range of on-site training opportunities are available based on the Client's specific requirements.

10.1.4 Fourth Layer of Training - Help Desk

If the first three layers of training are properly applied, the need for Help Desk support diminishes significantly; however, it is important to provide a final line of defense for your users over time as new questions and issues arise.

CitizenDeveloper provides a robust help desk and ticket remediation offering based on its ITIL-inspired IT Service Management policies and frequently helps clients to deploy their own IT Service Management capabilities.

11. STATEMENT OF INTENT TO PROVIDE CERTIFICATE OF INSURANCE

If notified of contract award, System Soft Technologies agrees to submit to AHCCCS for review and acceptance, the applicable certificate/s of insurance as required within the RFP document, within five (5) business days of such notification.

12. DETAILED LEGAL ANALYSIS

None.

13. APPENDIX A - ADDITIONAL INFORMATION

13.1 Hosting Options

The CitizenDeveloper Platform provides world class hosting services as a standard component of its technology stack. However, The CitizenDeveloper Platform also offers a range of enterprise grade options for Customers who are looking for a specific public-, private- or hybrid- cloud Hosting option.

13.1.1 The Most Advanced Hosting Technologies Available Today

The CitizenDeveloper Platform embraces two core architectural characteristics that impart a high degree of mobility to its customer base, namely the reliance on a Kubernetes Cluster to manage Docker Containers.

Most modern cloud providers and a very high percentage of Enterprise Data Centers run or support Kubernetes clusters that in turn manage Docker Containers. Some examples include:

Most major Enterprise Data Centers and more.

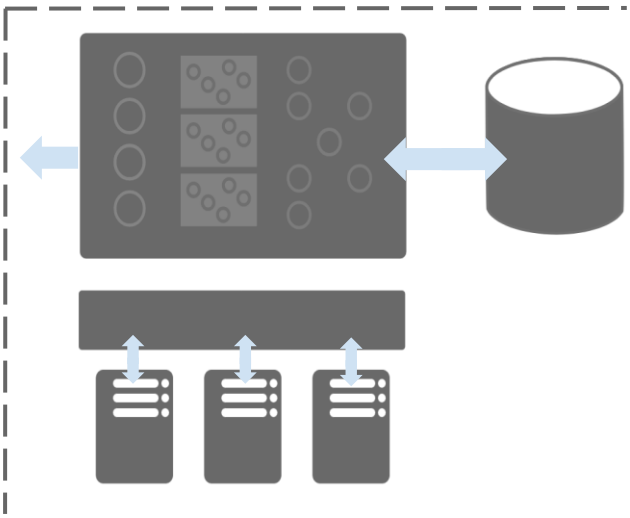
Importantly, some Kubernetes clusters can span multiple regions and even multiple providers.

13.1.2 On Premise versus Cloud

The decision to host a CitizenDeveloper Platform application on premise or on the cloud is an application-specific one and depends highly on the regulatory, security, or compliance requirements of the application. Generally speaking, hosting on the cloud is faster and easier both to set up and

maintain. The CitizenDeveloper Platform provides a cloud hosting option "out of the box" with no additional setup. However, on premise, aka "behind the firewall", hosting and hybrid deployments are also possible. To host on premises one simply needs:

- Available Hardware
- A Container Manager (Google Kubernetes)
- Docker
- A Datastore
- A reliable high-speed internet/network connection



13.1.3 Hybrid Clouds

Because of the architectural foundation of Docker containerized microservices and Kubernetes, Hybrid cloud installations are possible with additional configuration. Hybrid clouds involve the management of Containers both on the premises AND in the cloud. High-bandwidth internet connections with direct hops to the cloud hosting provider(s) are strongly recommended under this model.

13.3 Hosting Recommendation

13.3.1 We Recommend Google Container Engine*

Google Container Engine is a recommended platform for the deployment and management of Docker Containers.

*(Many of the below benefits could be achieved by deploying a local version of Google's Kubernetes Container Management Platform on the AHCCCS premises, or by using alternative Docker Management services.)

Performance - The Google Architecture includes fast memory, solid state drives for quick read and write of your application's data, and Google's dark-fiber connections between zones and regions.
Scalability - Google offers near-infinite scaling ability for your application at a highly competitive cost. Use as many or as few resources as your application needs.
Security - The Google Cloud Platform offers compliance to security standards for Fedramp, SOC, ISO 27001, PCI, HIPAA, CSA STAR, and much more. Please speak with your sales representative about any specific compliance needs.
Point to Point Communication - Google offers the most advanced and highly monitored point to point authentication tools, which means that you can sleep well knowing that your application communication traffic is highly secure and confidential.
Data Storage and Processing - All data is exclusively stored and processed on the Eastern Seaboard of the United States.
Multi-Zone, High Availability Deployment - Although Google uptime is near perfect and they currently offer a 99.99% uptime SLA, we can provide extra assurance by deploying containers across multiple zones ensuring that a catastrophic event in a particular zone will not cause your users any downtime. Because each container is stateless, loss of one region will not interrupt usage or affect availability.
Data Management - Google's Data Management services are second to none in terms of reliability and protection against any form of catastrophic data loss. As always, CitizenDeveloper will also take periodic and live data backups as an extraordinarily protective step.

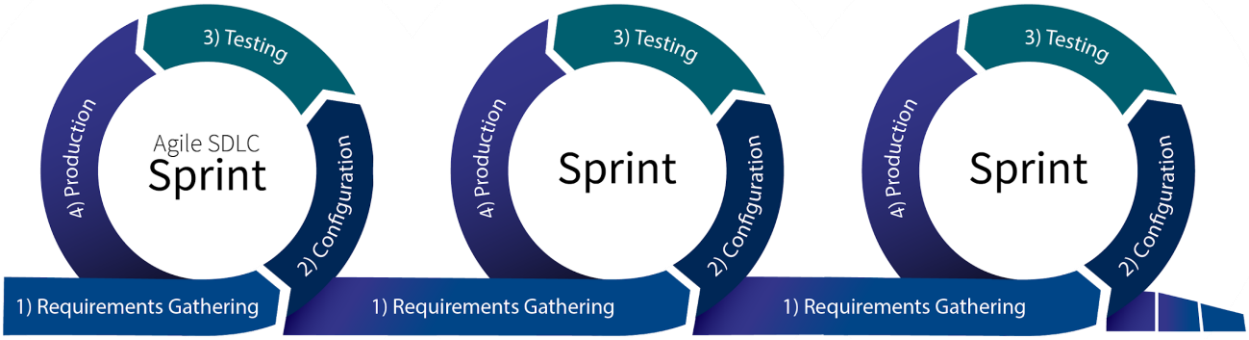
13.3.2 Google Cloud Services Used by the CitizenDeveloper Platform

The following services provided on the Google Cloud Platform are currently in use by the CitizenDeveloper Platform in some deployments:

Cloud DNS - Provides DNS service with API access
Container Engine - Google's managed Kubernetes cluster environment. This controls auto-scaling (container and system level) and individual system maintenance
Compute Engine - Launches microservices and maintains individual apps/installations

Cloud Storage - Content storage and secure user data backups
Cloud CDN - Provides Cloud Storage content globally via fastest routes
Cloud Datastore - A NoSQL environment for storage of certain data
Cloud Functions - Used by CitizenDeveloper.com to access components of its codes base.
Stackdriver - Logging and monitoring for VM systems, Google services, and individual microservices.

13.5 Software Delivery Lifecycle (SDLC)

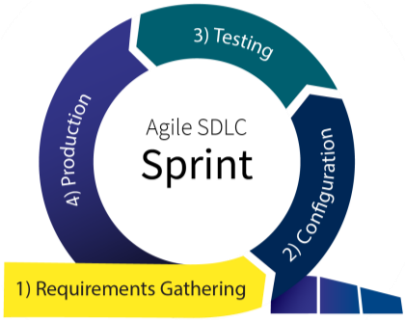


CitizenDeveloper utilizes 4 stages in the configuration of the AW Portal for the AHCCCS. The 4 stages are Requirements Gathering, Configuration, Testing and Production.

Requirements Gathering begins with a consultation with the Agency to establish the requirements the AW Portal needs to address to maximize functionality. Within the Configuration Environment, the development team modifies the software settings and features to enable the Agency's team to efficiently manage their workflow. The Testing environment allows for collaborative testing of configuration by the Agency and CitizenDeveloper to ensure that your business needs are met by the proposed solution before it is put into production. The Production environment is used by the Agency and is isolated from any configuration or testing changes. Production is never interrupted by other processes. Updates to the Production environment only happen after rigorous testing occurs, and a Production Rollout takes place with less than 15 minutes of application downtime.

We utilize the Agile project methodology, where sprints are established to move the AW Portal through the quick configuration process to Testing and ultimately to Production after approval from the Agency. This process is repeated as needed throughout the configuration life cycle.

13.5.1 Requirements Gathering



The AW Portal offers a fast, easy and proven method of gathering customer requirements, by asking three simple questions; "What functions do you want to track?", "What types of Users will use the Application?" and "How will each type of User use each Function"?

13.5.1.1 Functional Areas

Specific or broad groups of functionality analogous to the traditional concept of a Table or a grouping of Tables that work together for a common purpose. We ask the question "What types of people, places or things will this application track?" To further expedite the process, we also seek to categorize and isolate a range of "supporting functions" such as;

- History
- Classification
- Aggregations
- Intermediaries
- Transactions
- ...and more

Additionally, to facilitate the creation of various Functional Areas, the AW Portal will frequently request access to or copies of a wide range of documentation including;

- Application screens
- Data schemas
- Business Documents
- ...etc.

13.5.1.2 User Roles

A list of the types of people who will use the Application, sometimes referred to as "User Groups". We ask the question "What types of people will use this software?"

Broadly, different User Roles will receive different types of access to functionality and pages, including interface access privileges like View, Edit, and Add, but also including Create, Read, Update, and Delete (CRUD) access to Data via a record security model. Finally, different User Roles will receive access to various automations and reports.

13.5.1.3 User Stories

These represent the actual Features Descriptions of the application, and are structured as the answer to the following question: "How will a User Role interact with a specific functional area?"

The resulting matrix of each User Role interacting with each Functional Area has proven to be a fast, effective method of recording and communicating Feature Descriptions in the form of User Stories. Importantly, this matrix approach allows the team to easily spot any gaps in functionality or consideration, minimizing the need for costly Change Orders or missed features later.

This highly structured approach is simple, fast and effective. Individual Features within a particular User Story are categorized using the following buckets for easy understandability by both the Client and the Customization Team:

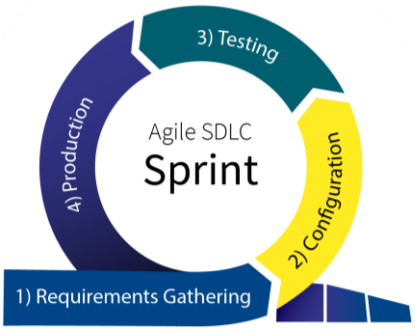
- Interfaces
- Workflows/Automations
- Integrations
- Reports

Combined, this approach of getting answers to simple questions and collecting knowledge about Functional Areas, User Roles and User-Function Stories has proven to minimize Client effort and resources while maximizing completeness and investigative thoroughness into the business requirements.

13.5.2 Configuration, Customization, Development

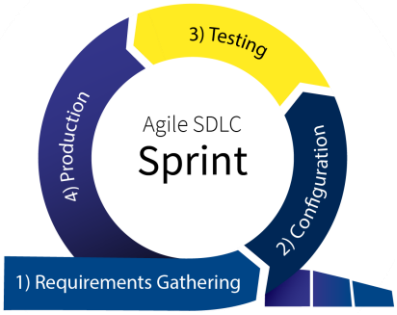
The AW Portal Team believes in providing the maximum flexibility to the Client while minimizing configuration and customization time We accomplish this through the use of Citizen Development.

13.5.2.1 Citizen Development



Most applications are built entirely utilizing only Citizen Development, without writing code. Use Citizen Development when there is a need to modify or build a lot of features quickly and at the lowest cost. Citizen Development is simply the fastest, least expensive method for producing software application features available today. This unique approach to software development allows rapid deployment of Commercial-off-the-shelf (COTS) products.
Citizen Development can be performed by individuals with only a limited technical knowledge, including business team members, business analysts, spreadsheet wizards, or sometimes just a frustrated team member who is tired of waiting to get the features they need to do their job better!

13.5.3 Testing



The AW Portal Team incorporates rigorous, multi-stage testing disciplines to bring factory-level control to the software development process. These various testing disciplines overlap to bring the highest level of deployed software quality while minimizing the Client's time commitment and expense. To understand the effectiveness of this approach, consider each specific testing stage:

13.5.3.1 Data Conversion Tests

CitizenDeveloper strives to identify and reject 100% of record imports that exhibit duplicate or data type mismatch characteristics. Such rejections are subject to analysis and possibly remediation. Data receipt from integrated systems are similarly errored, analyzed and possibly remedied.

13.5.3.2 Unit Testing

Unit Testing Occurs at the Platform Level.

Community Platform Engineers conduct Unit Tests on each component that is used in an application version. This includes interface components like an address field or a bar chart; logic components like a notification or a complex calculation; data components such as a specific database adapter or third party integration.

Before any component is released to an application, it is already tested not just by the Community Platform Engineer who originally conducted the Unit Testing on it, but also by the entire community of Citizen Developers who have already used it in other products.

Collectively, the AW Portal Unit Testing model reduces the amount of bug testing required and the volume of bugs reported at the Client or User level by over 90%.

This is not just a significant time and cost savings for the Client, but it greatly reduces the frustration level of the Client and greatly increases the chance of success of the Project!

13.5.3.3 System Testing

System Testing is conducted in the Configuration Environment.

Before the Citizen Developer releases an application version to the Testing Environment, they must verify that a full set of features has been produced and is functioning properly for this sprint. Proper System Testing will include:

- Review of Functional Requirements
- Validation of CRUD capabilities for each Functional Area
- Record Security policy enforcement
- Graphical Interface Review
- Usability Review
- Workflow Testing
- Sandbox testing of relevant Integrations
- Report Testing
- Gut Check - Are Client's Expectations being met?

Thorough System Testing is essential to minimizing Client frustration.

13.5.3.4 Software Performance Testing

Software Performance Testing can be performed in either a fully featured Testing Environment or, if one is not practically available, in the Production Environment.

Software Performance Testing is frequently enacted by identifying test scenarios that are known to stretch the performance limits of the Service Level Agreement (SLA), but can also involve random sampling of performance throughout the application.

The goal of Software Performance Testing is to ensure page response times and other performance metrics of the application relative to the User experience. This is of particular significance when the User works within the application in what is called a "high production" or sometimes "clerical" environment; this is because the User's overall job productivity is directly impacted by the responsiveness of the application that they spend so much time working in.

Therefore, particularly in high production environments, Software Performance Testing is critical to ensuring that the software project meets the business goals set out for it.

13.5.3.5 Penetration Testing

Penetration Testing is best performed against the Production Environment.

Penetration Testing is a form of security test that probes the application for code vulnerabilities and attack vectors.

The AW Portal's high security architecture, coupled with its Unit Testing regimen and widespread adoption, commonly reduces Penetration Testing to essentially a formality that rarely uncovers critical vulnerabilities. Nevertheless it is an important step for maintaining compliances and peace of mind.

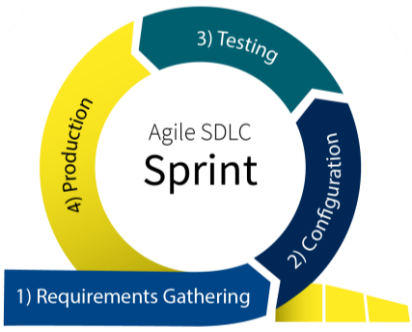
13.5.3.6 Web Application Testing Frameworks (optional)

A wide range of Web Application Testing Frameworks can be deployed to simulate many of the forms of User Testing described above. CitizenDeveloper has experience in, and is happy to consider the use of, many of the more popular frameworks.

13.5.4 Software Production

Production is a highly managed environment that powers the actual operations of the organization, and that contains actual organizational data. For this reason, it must represent the pinnacle of;

1. Security
2. Stability
3. Uptime
4. Performance
5. Features
6. Usability
7. Continuity



The AW Portal and the chosen cloud or private hosts provide multiple overlapping layers of monitoring, measurement and oversight to ensure that all 7 of the key characteristics mentioned above are always operating at their peak. These include:

1. Server Hardware Monitoring
2. Server Network Monitoring
3. Microservice Container Monitoring
4. Inter-Service Communications Monitoring
5. Server Firewall Monitoring
6. Internet and Packet Hop Monitoring
7. Client-Side Monitors deployed as a part of the Application feature package

The AW Portal offers a range of mission-critical Service Level Agreements (SLAs) to provide the highest level of assurance that the software will continue to securely operate at peak levels.

13.7 Accessibility and Compliance

The CitizenDeveloper Platform provides a range of tools to meet all major US and international accessibility standards.

13.7.1 Important Accessibility Standards

13.7.1.1 Section 508 of the ADA

Section 508, an amendment to the United States Workforce Rehabilitation Act of 1973, is a federal law mandating that all electronic and information technology developed, procured, maintained, or used by the federal government be accessible to people with disabilities. 508 Compliance, therefore, involves developing a website that can be used by people with limited vision or blindness, deafness, seizure disorders, and other disabilities.

13.7.1.2 WCAG 2.1 (backwards compatible to 2.0)

Web Content Accessibility Guidelines (WCAG) is developed through the World Wide Web Consortium (W3C) process in cooperation with individuals and organizations around the world, with a goal of providing a single shared standard for web content accessibility that meets the needs of individuals, organizations, and governments internationally.

The WCAG documents explain how to make web content more accessible to people with disabilities. Web "content" generally refers to the information in a web page or web application, including (a) natural information such as text, images, and sounds, and (b) code or markup that defines structure, presentation.

13.7.1.3 ISO/IEC 40500:2012

WCAG 2.0 is approved as an ISO standard: ISO/IEC 40500:2012. ISO/IEC 40500 is exactly the same as the original Web Content Accessibility Guidelines (WCAG) 2.0 from the W3C Web Accessibility Initiative (WAI).

There are important benefits of having WCAG as an ISO standard including: (a) the approval of WCAG 2.0 as an ISO standard benefits countries and organizations that can more easily adopt ISO standards, and (b) countries that previously adapted WCAG 2.0 may now be able to adopt WCAG 2.0 as is by referencing ISO/IEC 40500.

13.7.1.4 WCAG vs. 508

The WCAG 2.0 Success Criteria are more explicit than the existing 508 Standards. Careful attention has been given to ensure that the Success Criteria for WCAG are written as objectively testable

requirements. In addition, unlike the existing 508 Standards, WCAG 2.0 is written in a way that is technology neutral and is therefore directly applicable to a wide range of content types and formats.

Bottom line: Whereas 508 Standards are a common requirement in the United States, WCAG is more broadly the standard outside of the United States. However, the two are largely parallel.

Detailed differences in conformance criteria between WCAG and 508 are explained below.

13.7.2 508/WCAG Conformance Declaration

This document is a WCAG Conformance statement, modeled after the Voluntary Product Accessibility Statement (VPAT), but using the Web Content Accessibility Guidelines (WCAG) as conformance criteria. Due to the fact that Section 508 is out-of-date and that the pending refresh will incorporate WCAG by reference, the format below is more useful than the existing VPAT format.

13.7.2.1 508 Declaration

The AW Portal, as prepared by CitizenDeveloper and System Soft Technologies is fully compliant with the Americans with Disabilities Act (ADA) Information and Communication Technology (ICT) accessibility standards, Section 508 of the Rehabilitation Act of 1973 (29 U.S.C. Section 794(d)). Compliance with the 508 Standards and functional requirements will be met.

13.7.2.2 WCAG 2.0 Declaration

CitizenDeveloper routinely evaluates and updates its product roadmap, features and functionality to ensure compliance with WCAG 2.0 and WCAG 2.1 (backwards compatible to 2.0) at the Level AA accessibility standards.

Date: January 13, 2018; Reviewed and Updated May 20, 2018
Name of Product: The CitizenDeveloper Platform
For more information contact: CitizenDeveloper Disability Answer Desk

13.8 Supported Client Technologies

Web based technologies evolve, and the AW Portal was built to make sure you are not left behind. In order to provide the best web based technologies available not only today but also in the future, the CitizenDeveloper Platform supports the most cutting-edge browsers and standards. And as top new technologies emerge, CitizenDeveloper incorporates them.

13.8.1 Cutting Edge Client-Side Technologies

Importantly, CitizenDeveloper automatically upgrades its back end technologies, so that you can be confident that the AW Portal will still be at the cutting edge tomorrow! Key client-Side technologies currently supported and used include:

HTML5
CSS3
Bootstrap
React.js
Flux.js
Websockets
Local Storage

13.8.2 Supported Desktop Browsers

The AW Portal supports major web browsers including:

Chrome (latest version)	Firefox (latest version)	Internet Explorer (IE) 11	Microsoft Edge

13.8.3 Supported Mobile Browsers

The AW Portal is built with responsiveness and mobile in mind, and it is easy to configure UI changes when mobile form factors or browsers are detected. The AW Portal supports the following mobile browsers:

Mobile Chrome
Mobile Firefox
Mobile Safari

13.8.4 Supported Devices

By using these mobile or desktop browsers, your AW Portal installation will perform best using the following platforms:

Desktop
Tablet
Mobile

13.8.5 Other Requirements

No other specific or special hardware is required to run our solution.

13.10Identity Management

The CitizenDeveloper Platform Identity Management tools support deployment of a wide range of authorization, authentication, and multifactor options in virtually unlimited combinations.

13.10.1 Method of Support

Identify Management during the course of an authentication process in the AW Portal is entirely configurable using the full power of the logic configuration tools. This enables deployment of any viable Authentication Factor or 3rd party authentication tool (including single sign-on tools) with an accessible API; all in the order and manner required by the AW Portal.

Authorization support in the AW Portal is provided by configuring rules using any underlying data elements within the AW Portal such as its data tables, relationships, or fields.

13.10.2 Authentication Factors

The AW Portal supports the following Authentication Factors either directly or via a specific factors API:

Knowledge Factors, e.g. password, passphrase, secret questions or pins
Possession Factors, e.g. connected or disconnected tokens, software tokens
Inherent Factors, e.g. facial recognition, other biometrics

13.10.3 Multi-Factor and Multi-Step Authentication

The AW Portal can be configured to use virtually any X-factor or X-step authentication method desired. Examples include Multi-Factor Authentication, 2-Factor Authentication, Multi-Step Authentication, 2-Step Verification and much more.

13.10.4 Single Sign On Options

The AW Portal can be configured to be compatible with SecureAuth and other similar sign on approaches:

LDAP	oAuth	Single sign-on (SSO)	Active Directory

13.10.5 Authorization

Once authenticated, a User's access to functionality within the AW Portal is controlled by Authorization tools. All Authorization capabilities are also highly configurable, including the following common Authorization methods:

Individual authorization
Role-based authorization
Related record authorization
Delegated authorization
Record level authorization
...and much more

13.12Notification Management

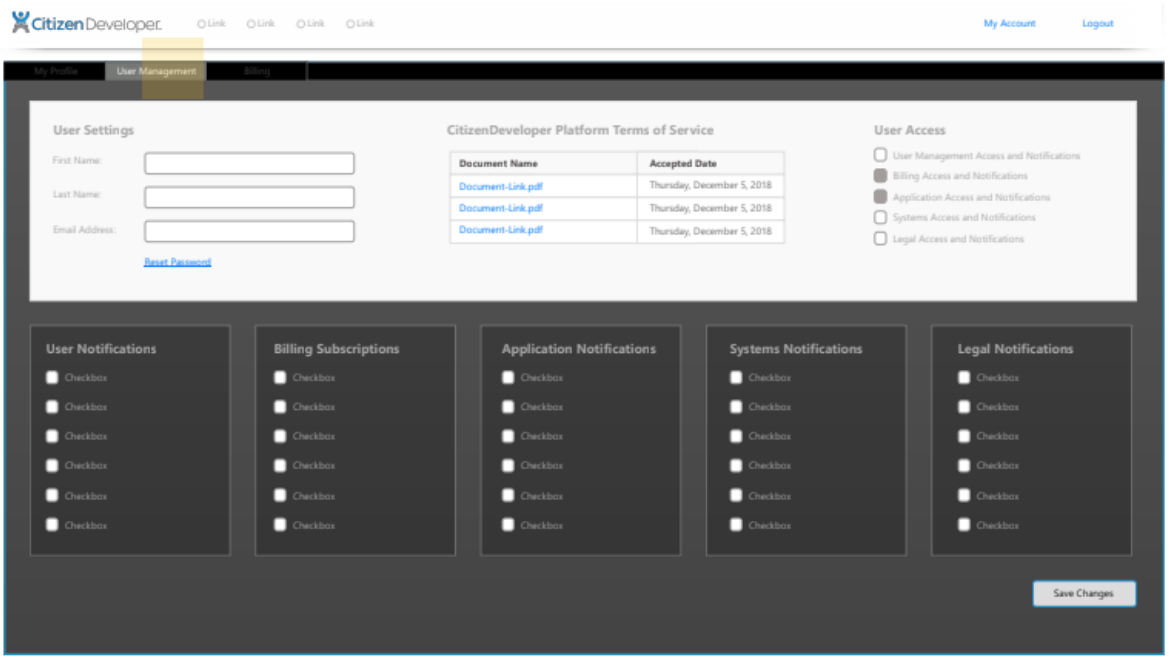
13.12.1 Notifications

The CitizenDeveloper platform supports rich, dynamic notification content delivered across every conceivable notification vehicle. In short, if you need a notification, it most likely can be configured. In addition to pre-built notifications in the Platform, Application Users are empowered to configure custom notifications to suit a very wide variety of needs; these include examples like an automated response to a request, a notification to complete a task, or a timed reminder of an upcoming deadline. All of these configurable notifications are available using the standard application configuration toolset.

13.12.2 Platform Notifications - Subscriptions

All Platform users can, by checking the appropriate box, "subscribe" to pre-built notifications within the following functional groups (assumes the User has been granted access to that functional group by an administrator):

User Management Notifications (e.g. Users added, deleted, etc.)
Billing Notifications (e.g. Invoice, Past Due Invoice, Payment Receipt, etc.)
Application Notifications (e.g. Application added, deleted, rollout performed, etc.)
Systems Notifications (e.g. security updates, usage notifications, resources added/removed, etc.)
Legal Notifications (e.g. Update to Terms of Service, etc.)



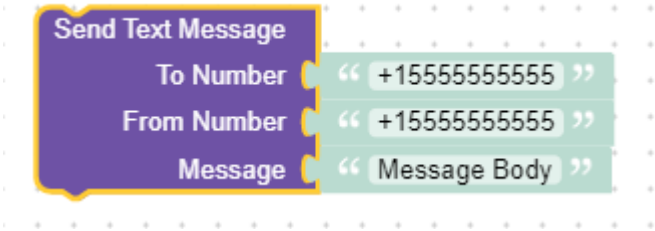
13.12.3 Application Notifications - Content Configuration

Within any specific application, unlimited combinations of messaging, message content, notifications, opt-in/opt out and other capabilities are possible. Some examples include:

- Static or Dynamic message content
- Messages can be sent based on specific user actions (e.g. on click of a button) or based on logical actions such as based on a set schedule, or based on the result of an evaluation
- Ability to set any form of opt-in/opt-out including use of opt-in capabilities such as web forms. System can provide for other types of subscription preference management as well.
- Content of messages can be any content managed by the platform including static or dynamic messages, schedules, task reminders, information about a particular record, and much more.
- Communication can be two-way, supporting forms of dialog between recipient and the computer.
- The CitizenDeveloper Platform leverages cloud-scale message delivery that includes international deliveries, meaning that there are few practical limitations to the volume of messaging produced or the content of that messaging.
- There are 6 vehicles available for notification:
  - SMS
  - Email
  - Voice
  - Toast
  - In-App
  - 3rd Party Service

13.12.4 SMS Delivery of Notification

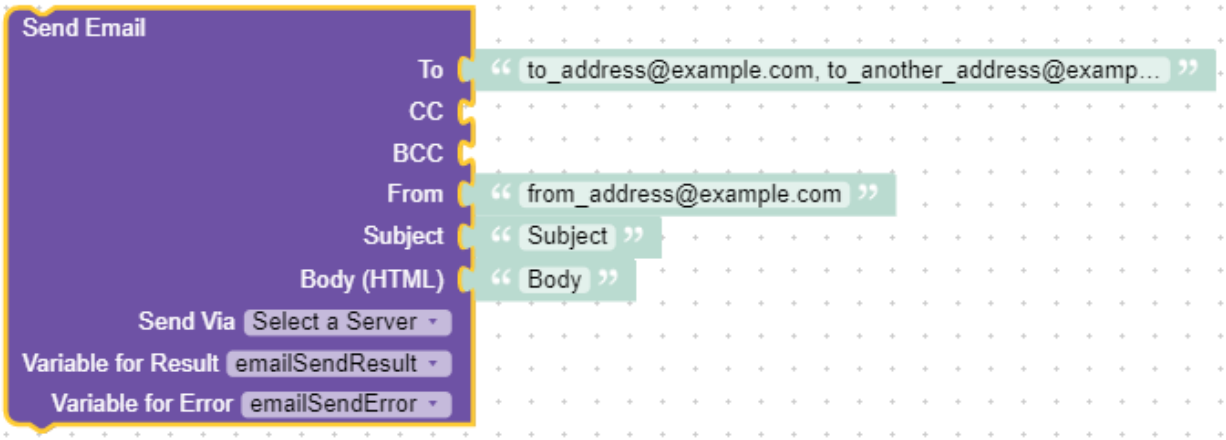
SMS delivery implementation in the AW Portal is simply a case of placing the SMS building block (shown here) amongst the other business process and workflow that's being configured. The SMS block is simply inserted into the logic chain as desired, and the 3 key values of "To", "From" and "Message" are subsequently configured. These values can be static, dynamic, simple or complex, a direct value or the result of an evaluation, etc. Importantly, like all other logic components, they can be processed in serial or in parallel, with parallel asynchronous processing supporting cloud-scale levels of SMS volume if that is desired.



13.12.5 Email Delivery of Notification

Email delivery implementation in the AW Portal is simply a case of placing the Send Email building block (shown here) amongst the other business process and workflow that is being configured. The

Send Email block is simply inserted into the logic chain as desired, and the 3 key values of “To”, “From” and “Body (HTML)” (and other optional values) are subsequently configured. These values can be static, dynamic, simple or complex, a direct value or the result of an evaluation, etc. Importantly, like all other logic components, they can be processed in serial or in parallel, with parallel asynchronous processing supporting cloud-scale levels of Email volume if that is desired.

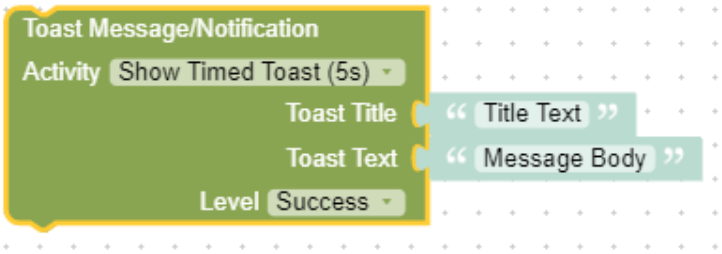


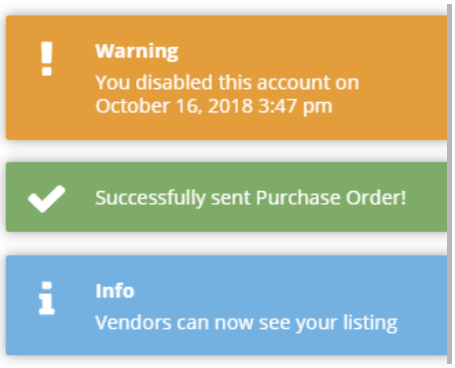
13.12.6 Voice Delivery of Notification

Voice delivery implementation in the AW Portal is simply a case of placing the Voice building block amongst the other business process and workflow that is being configured. The Voice block is simply inserted into the logic chain as desired, and the dialog outbound, as well as the input accepted back (e.g. “for sales, press 3”), and other optional values, are subsequently configured. These values can be static, dynamic, simple or complex, a direct value or the result of an evaluation, etc. Importantly, like all other logic components, they can be processed in serial or in parallel, with parallel asynchronous processing supporting cloud-scale levels of Voice notification volume if that is desired.

13.12.7 Toast Delivery of Notification

A Toast is simply a little dialog that appears easily within the interface to notify the User. A Toast can sit on the screen for a specified time, or, can sit on the screen until dismissed by the User. Toast delivery implementation in the AW Portal is simply a case of placing the Toast Message/Notification building block (shown here) amongst the other business process and workflow that is being configured. The Toast Message/Notification block is simply inserted into the logic chain as desired, and the 2 key values of “Toast Title” and “Toast Text” (and other optional values) are subsequently configured. These values can be static, dynamic, simple or complex, a direct value or the result of an evaluation, etc. Importantly, like all other logic components, they can be processed in serial or in parallel, with parallel asynchronous processing supporting cloud-scale levels of Toast Message volume if that is desired.

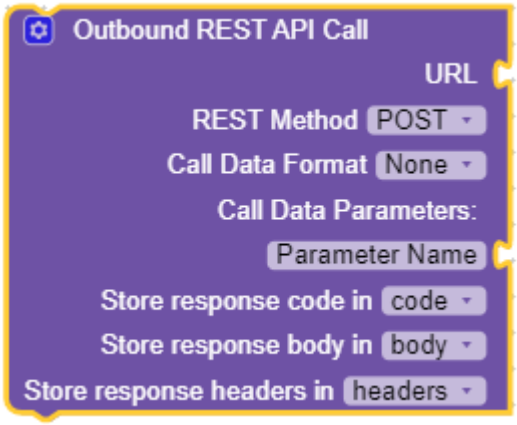




13.12.8 In-Application Delivery of Notification

Notification in the AW Portal using inline pages or modal dialogs is implemented by placing the Open a Page building block (shown here) amongst the other business process and workflow that is being configured. The Open a Page block is inserted into the logic chain as desired, and the key values shown below, as well as other optional values, are subsequently configured. These values can be static, dynamic, simple or complex, a direct value or the result of an evaluation, etc. Importantly, like all other logic components, they can be processed in serial or in parallel, with parallel asynchronous processing supporting cloud-scale levels of notification volume if that is desired.

13.12.9 3rd Party Service Delivery of Notification



3rd Party Service delivery Implementation in the AW Portal is simply a case of placing the Outbound REST API Call building block (shown here) amongst the other business process and workflow that is being configured. The REST API block is simply inserted into the logic chain as desired, and the key values shown below are subsequently configured. These values can be static, dynamic, simple or complex, a direct value or the result of an evaluation, etc. Importantly, like all other logic components, they can be processed in serial or in parallel, with parallel asynchronous processing supporting cloud-scale levels of 3rd Party Service volume if that is desired.

13.13Transaction Management

The AW Portal Platform takes data integrity concerns very seriously, offering a world-first three (3) layers of transaction management; these include traditional software or database transaction management, but also a new form of transaction management that is delivered architecturally through use of a redundant set of ultra high availability stateless microservices.

13.13.1 What is a Transaction?

Simply put, a transaction is a single piece of work that a database must do, but that is comprised of multiple logic and data steps; if the entire transaction processes then it is considered complete, but if the entire transaction does not process for any reason, than any partially completed steps must be rolled back.

13.13.2 Why are Transactions important?

In the AW Portal Platform, particularly with Ultra High Availability deployment models and the Stateless Microservice Architecture, Transactions are not as important. However in traditional development models, they are critical to addressing the question "what happens if an error interrupts a process?" In the traditional environment without Transactional processing, mission critical errors can occur that have real-world consequences. For example, if a financial transaction is interrupted, incorrect amounts could be paid out, accounts could be thrown out of balance, and there may be no simple way to discover that this even occurred, how it occurred, or why.

13.13.3 Software Level Transactions

Any AW Portal Platform application can be configured to set transaction start and stop flags at the beginning and end of a transaction respectively. This type of software uses logic to enforce the integrity of a transaction. In practice, the software will essentially undo any actions taken after a start flag that failed to receive its corresponding end flag within a designated period of time.

The AW Portal Platform recognizes multiple ways to design software transactions, including use of a logging and undo method and also including use of a temporary data store method.

13.13.4 Database Level Transactions

The traditional and most common method of ensuring data integrity through transactions is via the database and the use of temporary versus permanent commits. In this model, database updates are designed to be a part of a transaction, and are identified as such. Any data updates are marked as temporary, and only marked as permanent when the transaction completes. If the transaction fails to complete the temporary updates are erased. There are multiple implementation models and methods as supported by your database.

13.13.5 Architecture Level Transactions

Stateless, Ultra High Availability microservices that update data to at least a High Availability database offer a new form of transaction management.

13.13.5.1 Stateless Microservices

Stateless Microservices do not own any data, and don't care how their requests are processed; they simply return a result or generate a repeat of the failed request. The Microservice Manager has the authority to re-route requests to existing or even newly created Microservices, as needed, until a result is generated, at which point the issuing Microservice can release its request. Data Integrity is assured because a failing Microservice doesn't maintain any knowledge of state.

13.13.5.2 Redundant Environment

Because these Microservices exist in a redundant, Ultra High Availability environment, there is never an absence of a Microservice able to receive a request. In other words, the Microservice Manager has the authority to re-route or to create new Microservices at any location in which it controls resources. The net effect is that all services are processed with a similar level of integrity as if they were designated to be "Transactions".

13.13.5.3 Now, Everything is a Transaction!

Essentially, the traditional concepts of starting a transaction and rolling back an incomplete transaction become subsumed by the normal operations of the Stateless Microservice and the Microservice Manager, while processing availability is assured by the Containerized Architecture. Every activity is essentially treated with the importance of a transaction!

13.13.5.4 Always Included with the AW Portal Platform!

All AW Portal Platform applications come with Architecture Level Transaction Management right out of the box! No additional design, software coding or database coding is required…in fact, the features are automatic for all applications!

13.13.6 Transaction Performance and Architecture Level Transactions

As always, transaction performance can be improved at cloud-scale, at each level of transaction; software level, database level and architectural level. However one significant drawback to using traditional Transaction Management methods is commonly encountered when measuring transaction performance. The larger and more complex a transaction is, the fewer transactions per second that a system can process. Although the retail database provided by the CitizenDeveloper Platform supports 10,000 reads per second per node, and 2,000 writes per second per node, and although nodes can be scaled up to meet demand in just seconds (thereby supporting very high transactions per second; up to 2,000/second/node for single commit transactions), the real power of Architectural Level Transactions truly shines through when considering transaction performance.

Essentially, by treating the entirety of back end processing all as transactions architecturally, the full power of the architecture becomes available to process transactionally at very high throughputs.

13.14 Reporting Capabilities

13.14.1 Three Reporting Architectures Available

The CitizenDeveloper Platform offers three architectures for generating and managing reports. First, you can use the native reporting tools provided by the CitizenDeveloper Platform. The tools can be added using our open community engineering framework. Note that these tools make it easy to create dashboards, lists and all manner of traditional reporting interfaces integrated within your application. Second, you can configure your preferred reporting tool to report directly against your database. Finally, the CitizenDeveloper Platform supports the use of API's to batch or stream data to a data warehouse of your choosing for reporting and analysis using the tools of your choice.

13.14.2 Native Reporting Features

CitizenDeveloper.com is engineered from the beginning to deliver on a comprehensive "wish list" of reporting needs. The platform makes reporting easy, fast, comprehensive, secure, and scalable:

13.14.2.1 Always Easy to Build!

The CitizenDeveloper Platform doesn't work if Citizen Developers can't build reports. For that reason, we started our reporting feature list with the perfect-world set of usability features:

Non-technical Users can easily build reports
No-code report building
Advanced Pattern and Machine Learning tools suggest reports based on common usage patterns across thousands of applications
Advanced Natural Language-based reporting tool guides the user through the process of specifying details about their report
Easily build charts, graphs, document, and table reports
Easily set up delivery models such as "email to Supervisors on Friday nights"

13.14.2.2 Pre-built reports

The CitizenDeveloper Platform provides a robust ability to configure reports in the configuration environment and then release them to Users in the production Application.

Single-click report generation from anywhere within the application
Dashboards with key metrics and results always on display, 24/7, using live data.
Inline printable and exportable reports that make every useful screen a possible report
Full range of charting and graphing capabilities to properly visualize and analyze large amounts of data

Full range of output formats including on-screen, spreadsheet, pdf document, email, text, and much more.

13.14.2.3 User-Defined Custom reports

In addition to pre-configured reports, Production Users can leverage the reporting engine to build their own reports!

Users of the application can build their own reports
No-code necessary
Run-time customization is possible: in other words when running a report, the report can request additional specific details from the user to refine the report, such as a specific date range, department, status, sorting method, or some other filtering value.

13.14.2.4 3rd Party reporting tools

The CitizenDeveloper Platform provides two architectures for leveraging your own reporting tools.

By pointing a reporting tool at your CitizenDeveloper Platform database, you can leverage those reporting tools with data queried directly from this Application
Batch or Stream data to an existing data warehouse or analytics repository, and use those tools

13.14.3 Important Technical Considerations

13.14.3.1 Security

When using the CitizenDeveloper Platform's native tools, reportable data from the database is always passed through the Record Security Model. This means that Users will not be able to run reports that reveal data that they are not authorized to access by the Application.

13.14.3.2 Speed

The Platform architecture is asynchronous, meaning that complex reports and/or large volumes of reports can be processed simultaneously in parallel. This produces a dramatic reduction in the response time between a report being requested and a report being delivered for very large, highly complex, or for multiple successive reports. This also means that a single dashboard page that includes multiple reports will load in the fastest possible time, because each element of the dashboard can be initiated, processed and delivered to the page simultaneously.

13.14.3.3 Scalability

The Platform architecture is based on Containerized Microservices, which means that the Platform can shift resources to the reporting engine on-demand, as needed, and then scale those resources away when it's not needed. Massive reporting loads are possible because the Platform can instantiate a very large number of reporting Microservice Containers on demand.

13.14.4 Native-Available Chart Types

<table>
<tr>
<td>In-line List
Users can filter
Users can customize columns
Supports filter-by-field
“And” filters</td>
<td>
<table>
<tr><th>Vendor</th><th>Contact</th><th>Activation Status</th></tr>
<tr><td>Zonway</td><td>Doe, Rachel</td><td></td></tr>
<tr><td>Kinhigh</td><td>Smith, John</td><td></td></tr>
<tr><td>Viladox</td><td>Fetch, Wayne</td><td></td></tr>
<tr><td>Lanehouse</td><td>Roddet, Sue</td><td></td></tr>
<tr><td>Groovezim</td><td>Yin, Matt</td><td></td></tr>
<tr><td>Ganzfase</td><td>Becker, Taylor</td><td></td></tr>
<tr><td>Kinhigh</td><td>Smith, John</td><td></td></tr>
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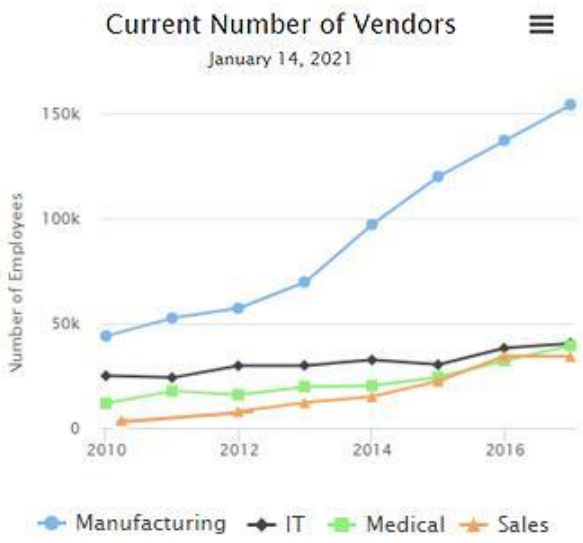
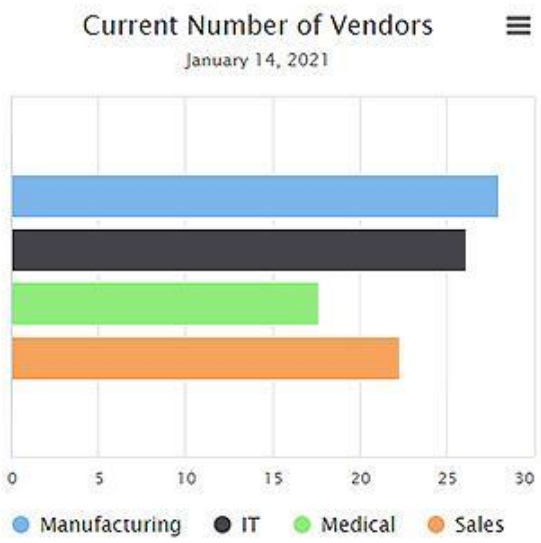
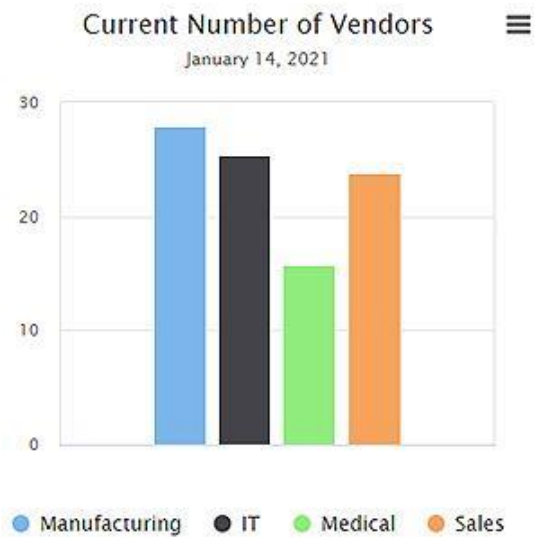
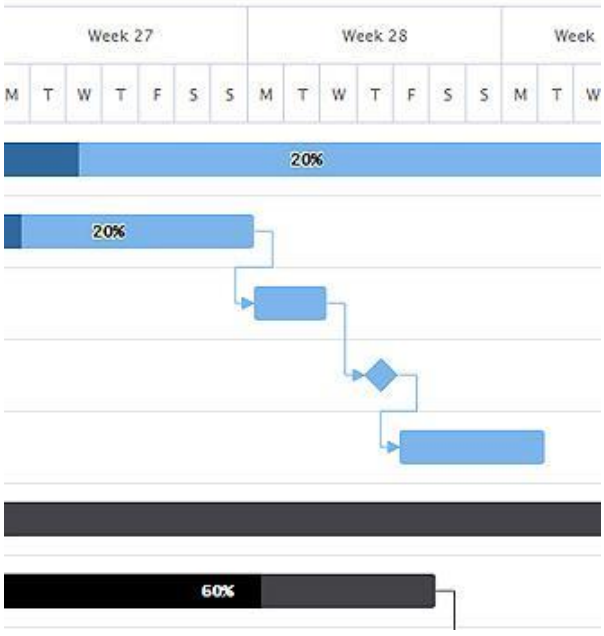
<tr><td>Groovezim</td><td>Yin, Matt</td><td></td></tr>
<tr><td>Ganzfase</td><td>Becker, Taylor</td><td></td></tr>
</table>
</td>
</tr>
<tr>
<td>Line Chart
Multi series
Can add title and subtitle
Supports range of axes
Supports linear, algorithmic and date/time type vertical axes
Supports adding grid lines with customizable width
Users can zoom in or out
Users can control data including labels, aggregation function, series, and values
Users can display or hide legends
Users can display or hide data labels
Users can enter screen reader descriptions and automatically access other accessibility features with no further customization</td>
<td>


</td>
</tr>
</table>

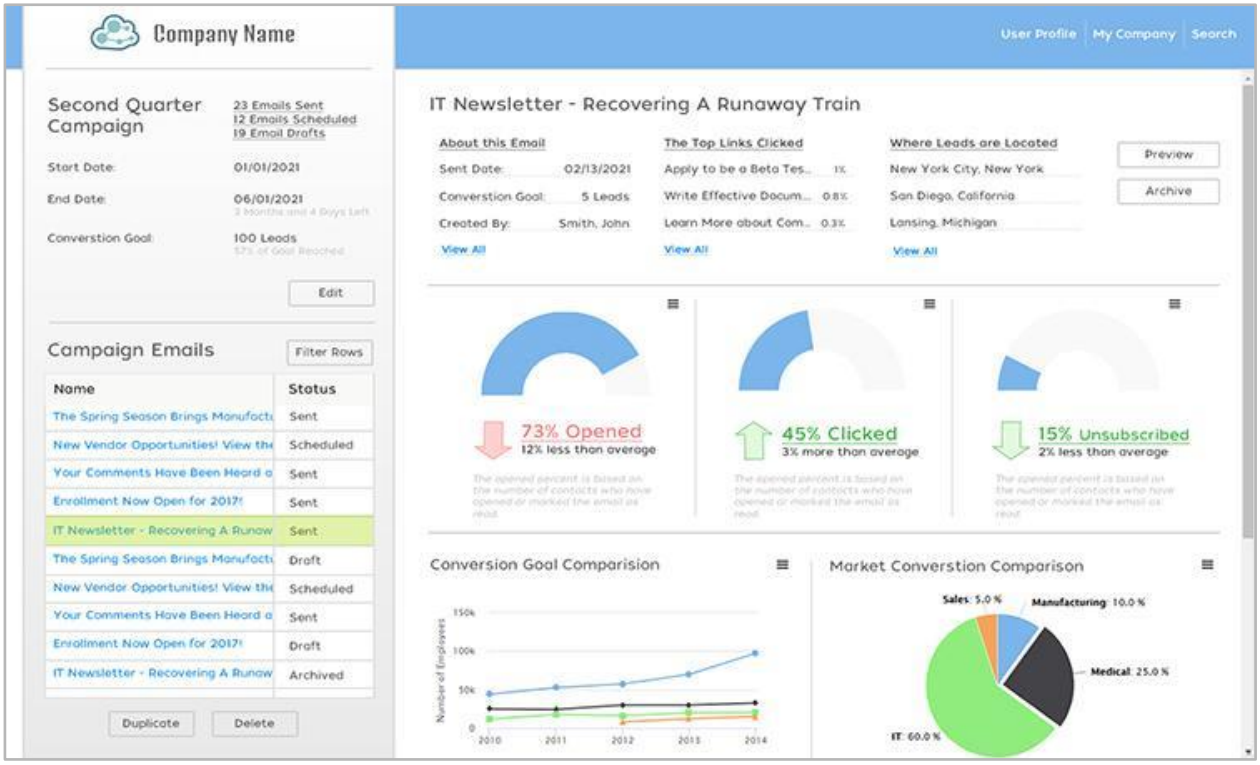
Bar Chart Multi series Can add title and subtitle Supports range of axes Supports linear, algorithmic and date/time type horizontal axes Supports adding grid lines with customizable width Users can zoom in or out Users can control data including labels, aggregation function, series and values Users can display or hide legends Users can display or hide data labels Users can enter screen reader descriptions and automatically access other accessibility features with no further customization	
Column Chart Multi series Can add title and subtitle Supports range of axes Supports linear, algorithmic and date/time type vertical axes Supports adding grid lines with customizable width Users can zoom in or out Users can control data including labels, aggregation function, series and values Users can display or hide legends Users can display or hide data labels Users can enter screen reader descriptions and automatically access other accessibility features with no further customization	

Donut Chart Multi series Can add title and subtitle Users can control data including labels, aggregation function, series and values Users can display or hide legends Users can display or hide data labels Users can enter screen reader descriptions and automatically access other accessibility features with no further customization	
Gantt Chart Multi series Can add title and subtitle Users can zoom in or out Users can control data including series, event name, parent events, dependency events, start date, end date, milestone status and percent completed. Users can display or hide legends Users can enter screen reader descriptions	

Gauge Chart (Dial) Multi series (represented as individual gauges) Multi values on one gauge (represented as different-colored needles) Can add title and subtitle Users can control data including individual needle series, aggregation function, individual gauge series and values Users can display or hide legends Users can enter screen reader descriptions and automatically access other accessibility features with no further customization	
Gauge Chart (Solid) Multi series (represented as individual gauges) Multi values on one gauge (represented as different-colored arcs) Can add title and subtitle Users can control data including individual arc series, aggregation function, individual gauge series and values Users can display or hide legends Users can enter screen reader descriptions and automatically access other accessibility features with no further customization	

Pie Chart Multi series Can add title and subtitle Users can control data including pie slice name, aggregation function, series and pie slice size Users can display or hide legends Users can display or hide data labels Users can enter screen reader descriptions and automatically access other accessibility features with no further customization	

13.14.5 Example Dashboard (Aggregation of Reports)



13.15Document Management

The AW Portal supports a complete set of robust, cost effective, enterprise-grade Document Management tools including:

- Workflow
- Storage
- Imaging
- Indexing and Searching
- Control
- Security
- PDF Management
- Google Drive and other Personal Productivity Tools
- Performance

13.15.1 Workflow

The AW Portals robust no-code development provides a comprehensive set of workflow models that range from assignment to routing to alerting and automatically incorporate all available security, imaging, indexing, storage and control tools.

Documents can be assigned to individuals or groups, populate task lists and even be delivered by mobile alerts up to and including SMS messaging. All workflow can be timed or otherwise tracked, and performance metrics can be produced and delivered in dashboards, emails or to a mobile device.

The AW Portal supports a wide range of native and 3rd party Robotics concepts for automatic handling of specific documents based on metadata about that or information contained within the document.

13.15.2 Storage

The AW Portal automatically routes all documents to a highly secure, low-cost, high-availability cloud storage facility. Document storage SLAs for uptime and availability are included with a standard or upgraded CitizenDeveloper SLA. In general, the AW Portal supports two types of storage:

Bulk / affordable document storage - inexpensive long term storage with immediate access up to and including Petabyte level storage. Bulk storage documents are each assigned a URL and are subject to all security and record security tools or protocols. Availability is possible up to and including geo-redundant, ultra-high availability for bulk storage documents.

Cold storage / Archival of documents - for data that will only rarely be accessed, and for which it is acceptable to have a slight lag in document retrieval times, cold storage methods may be used to further reduce document storage costs.

13.15.3 Imaging

The AW Portal works with service bureaus or other third party providers who specialize in bulk imaging and indexing. Any CitizenDeveloper Client can request a 3rd party imaging and indexing service.

13.15.4 Indexing and Searching

As desired by the Client, the AW Portal will utilize industry standard 3rd party tools such as Sphinx or Solr to perform full text searching and indexing of documents.

13.15.5 Control

The AW Portal provides standard or customized versioning models and a complete set of version management tools as desired up to and included complete version maintenance with roll back and roll forward.

Importantly, a full Audit Trail can be provided that tracks the critical "who, what and when" at a detailed level.

Lastly, any Client can request that document locking be enabled so that all documents are effectively "checked in" or "checked out", to prevent multiple users from accessing a document simultaneously.

13.15.6 Security

All documents in the AW Portal Document Management system are governed by the same security tools, protocols and network management that the entirety of the AW Portal platform is subject to. Any Security SLA that is attached to the primary application also applies to all document management.

All access to documents can vary across a wide spectrum ranging from tightly controlled document access subject to record-level or even document-level security up to the other extreme which is complete public access. These various options are a built-in components of the AW Portal platform.

Importantly, the AW Portal offers the ability to instantiate "non-refutability" protocols to strictly enforce the legal chain of authorship and ownership and versioning of specific documents.

13.15.7 PDF Management

The AW Portal places a high value on document management using PDF's and as such supports a wide range of interactivity with PDFs. PDF's can easily be generated from all reports, data or images within the application. Additionally, PDF forms can easily be populated using data within the application, and images can be embedded in them. Finally, data can be extracted from PDF forms.

All data inserted into or extracted from PDF's receive the full advantage of the complete set of the AW Portal workflow and data management tools.

13.15.8 Interaction with Personal Productivity Tools such as Google Drive

The AW Portal has a robust set of API's that allow documents to be created, copied, moved and updated, after applying all required security or workflow, on a personal productivity tool such as Google Drive. The result is an Application that powerfully interacts with an individual team members workspace for maximized productivity.

13.15.9 Document Management Performance Speeds

The AW Portal Platform comes "out of the box" with a robust set of highly scalable and self-scaling performance tools that are very relevant to particularly intense or voluminous document management applications or high-cycle document processing periods.

The Application's Performance SLA also applies to pages that fill a document management role. The Stateless Containerized Microservice architecture includes document related microservices that are inherently scalable on demand without additional programming or input from a Systems Administrator.

13.16Data Integration

13.16.1 Introduction to Integration

The CitizenDeveloper Platform leverages a modern REST API to provide full access to the data and logic within CitizenDeveloper applications. Configuring API access is easy and does not require an understanding of REST coding or capabilities.

13.16.1.1 Supports both Inbound and Outbound API's

The CitizenDeveloper Platforms integration capabilities include both "inbound" communications from 3rd party software and services, and also "outbound" communications to 3rd party software and services. This combination allows rich and dynamic integration with other software and data.

13.16.1.2 Supports Integrations with Devices, not just Software

All manner of network-connected software and devices may be accessed and even controlled by CitizenDeveloper Platform using an API. This includes things like card readers and printers, scanners and POS registers, and even doors, lights, and building equipment or machinery. This is in addition to software and databases.

13.16.1.3 Security

All CitizenDeveloper Platform communications are processed using SSL encryption TLS 1.2 or greater. API authentication can be further configured to provide a wide range of increasingly secure authentication methods. Once authenticated, all requests for data are subject to the CitizenDeveloper Record Security Service, which is enforced by the Record Processing microservice, providing an additional nested layer of security against API access.

13.16.2 Implementation of Inbound Integrations

To create an Incoming API call, one simply chooses from a list which type of REST interaction they wish to support within the CitizenDeveloper Platform, including the common commands of GET, PUT, POST, PATCH, and DELETE and defines the name of the end point. For example, GET and /contact.

Then, one can define each key they will expect in the URI query string, headers, or body. Body values can be in the form of JSON or even raw text. For example: contactId.

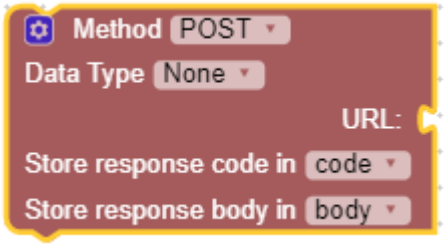
Lastly, one uses the standard non-programmatic logic interface that comes out-of-the-box with all CitizenDeveloper applications to map the previously-defined keys and to process any desired logic. For example, one would use query logic to search the Contacts table for a contact with the provided contactId, and then return that contact's details in whatever format the caller is expecting them.

Support for PUT, POST, and PATCH methods follow a similar pattern, but instead of finding a contact by Id and then returning it's data, you would configure the logic to create a Contact Record and update it's field values based on what the incoming API Call sent in, processing any needed logic on these values through the logic interface.

The DELETE method would make use of a Delete Record Logic Block to handle deleting the relevant records it finds.

13.16.3 Implementation of Outbound Integrations

CitizenDeveloper supports all manner of non-programmatic setup of outbound API access and integrations. Ad-hoc configurable REST integrations can be set up but in addition there are a wide range of non-programmatic integrations that are pre-configured and available out of the box. Outbound integrations can be set up as part of any existing logic chain, they can be triggered based on a timer, and they can take place in reaction to processing an inbound API call for two-way interaction with 3rd party services. Again, no coding is required to setup these REST implementations (See figures to the right illustrating a generic REST API logic block, and a pre-configured logic block to send an SMS message.)



13.16.4 Pre-Built Integration Examples

PDF (Fill tags, Embed image, Generate from HTML)
SMS (Send, Receive, Automated Conversation)
Email (Send via Elastic Email, Send via Outlook365, Send via Exchange, Send via GSuite, Read From Outlook365, Exchange, Gmail [POP or IMAP])
Comet Chat (Set User Details, Manage Buddies)
File Servers (Read Files/Folders, Download File, Upload File, Create Folder) like FTP, SFTP, SecureFTP, NFS, Windows File Sharing
Text Files (Create text file, append to text file)
Generate Signature Image (select font and font-size and the system generates an image version of the text written in the selected font and font-size)
Generate Chart Image (generates a static image version of a chart field)
Social Media (login via SM platform, post, get friends list)
Make Payment (PayPal, etc.)
Single Sign On - LDAP, Active Directory
Document Signatures - DocuSign
Accounting - Read and Write Accounts, Transactions, etc. in Quickbooks
IFTTT Publish Events, Subscribe to Events
Google Chat, Slack, Discord - post messages in channels/rooms.
Google Maps - Custom Pins, drawing shapes, drawing lines, etc.
Inbound REST API Method (mentioned in article above)
Outbound REST API Call (mentioned in article above)
...and many more

13.18Data Migration

The CitizenDeveloper Platform offers comprehensive, easily configurable Data migration and import and export tools and capabilities directly out of the box. All imports or exports must be configured to define, in the case of imports, what type of records are being imported, and how imported Values are mapped to Fields within the Application. Once configured, one simply needs to execute the corresponding import or export. The CitizenDeveloper Platform supports a standard Extract-Transform-Load ("ETL") model for data conversion:

13.18.1 Extraction

13.18.1.1 Legacy System Support

The CitizenDeveloper Platform brings the full power of its API and configurable logic model to enable both direct legacy system support as well as intermediary support via supported file types. The CitizenDeveloper Platform supports a wide range of legacy database interactivity.

13.18.1.2 CSV Format

The CitizenDeveloper Platform supports the industry standard "comma separated value" (CSV) format for both data import and export. In addition, other separators (other than a comma) are possible. CSV files can easily be converted from or to other standard formats including various Microsoft Excel Formats or Google Sheets formats, making it easy to manage data for import or export.

13.18.1.3 Archival

Sometimes it's not always necessary or prudent to perform a complete ETL procedure on all legacy data in various formats, including databases, tapes, flat files, etc.. In this case, exempt data can be extracted fully from the legacy system and archived using CitizenDeveloper cold storage, API, or other techniques and harnessing the full power of the configurable logic model as desired.

13.18.1.4 Big Data

When large volumes of data need to be analyzed for statistical purposes only, the CitizenDeveloper Platform will provide an integration directly to industry-leading big data solutions.

13.18.1.5 Other Data Communication Standards

The CitizenDeveloper is able to support a wide range of data communication and transmissions standards. These include, but are not limited to, EDI including ANSI ASC X12 and UN/EDIFACT, Service Data Objects (SDO), The Federal Geographic Data Committed Standard 014.7-2008, and many more.

13.18.2 Transformation

13.18.2.1 Cleansing Data.

The CitizenDeveloper Platform provides powerful tools for the identification of data in the legacy systems that need to be scrubbed or cleaned in order to ensure that information loaded into the target application is accurate and will support processing within the new environment. The CitizenDeveloper Platform enables configuration of a series of reports within the conversion process that can identify problem areas that require either a manual or automated cleanup. In cases where large amounts of data need to be cleaned, and that cleaning is possible in a programmatic manner, The CitizenDeveloper Platform provides powerful configurable logic tools to automate that cleaning process.

13.18.2.2 Errors, Deduplication and other Validations

The CitizenDeveloper Platform brings the full power of configurable logic to all imports and exports, which support the maximum number of validation possibilities including the common forms of error and duplicate ("deduplication") checking.

13.18.2.3 Error Reporting and Alerts

Additionally, in-application or externally-delivered notifications of a failed validation are easy to configure, including email recaps, a dialog on screen, and more.

13.18.3 Loading

13.18.3.1 Data Processing and Automated On-Demand Scaling

The CitizenDeveloper Platform automatically responds to specific systems and performance needs in real-time, on demand, and in a fully-automated capacity. This is particularly powerful when performing large data loads or imports, and certain key microservices are automatically scaled up and even replicated by the platform to materially increase the capacity to process the import. Some key microservices that scale up during a common import can include:

Record create
Relationship create
Expression Processing
Database Query

Importantly, the autoscaling features will commit additional hardware resources to the import as well, also entirely automated and on-demand.

The result of this scaling is typically greater than 90% reduction of times for processing an import versus traditional solutions, with no noticeable effect on normal operations of the application.

13.18.3.2 Data Conversion

Data will be mapped between the legacy systems and the new application. The implementer will be solely responsible for the extraction, transformation, and loading of all converted data. During an import, the full power of the CitizenDeveloper configurable logic engine allows all manner of value processing and expression processing, including robust text and number management. Common examples include data aggregation, value splitting, and much more.

13.18.3.3 Balancing, Check Digits, Hashes, and other Verification Tools

The CitizenDeveloper Platform configurable logic model makes it easy to configure a wide range of common validation or verification tools for analysis of the quality of a data import post-Load. This is a critical component of an ETL testing cycle. Some common methods include generating a Balance Report to verify account balances, use of Check Digits to verify more complex textual data such as long text fields, and a wide range of Hashes or other models. These verification models generate testing validity reports to determine the quality of a specific ETL process.

13.18.3.4 Extract Load Testing and other Lifecycle Consideration Issues

The CitizenDeveloper Platform tools are designed to support multiple iterations of Extract, Transform, and Load with all requisite validations and other verifications tools reporting intermittently.

13.20IT Service Management (ITSM)

CitizenDeveloper provides IT Service Management (ITSM) on between 30 and 70 active projects at any given time, and supports almost 1,000 completed projects globally. This makes CitizenDeveloper one of the few professional service organizations who can enjoy the unique perspective of building, configuring, and supporting applications at scale.

As a result of this unique perspective, CitizenDeveloper is pleased to offer one of the most detailed and robust ITIL-inspired service management programs in the industry including comprehensive processes, robotic request handling, and metric based performance tracking.

13.20.1 The Service Desk

CitizenDeveloper is proud to provide a wide range of vehicles for customers to communicate any needs, issues or concerns (all broadly labeled, regardless of source, as a "ticket"). Each of these Service Desk vehicles represents a Single Point of Contact (SPoC) but not necessarily a Last Point of Contact (LPoC):

Telephone during normal business hours or, subject to an expanded service level selection, during extended business hours, weekends, and holidays.
Email 24/7
Online Portal (desktop or mobile) 24/7
Note: Alerts generated automatically from monitoring tools such as network monitors or application diagnostics tools are also treated as an inbound communication, aka a "ticket" for purposes of the CitizenDeveloper ITIL-based ITSM policy.

13.20.2 The Service Catalog

All communications from a customer or from an automated alerting tool such as a network monitor, regardless of vehicle, purpose, or resolution, are broadly considered as a "ticket". CitizenDeveloper provides a library of Service Types in the form of a Service Catalog. Appropriate Robots or CitizenDeveloper staff (depending on the communication vehicle) are trained to classify a ticket into one of the many different available Services found in the Service Catalog based on an initial consideration of the Tickets Source, Urgency/Severity and Type. Tickets may then be considered for Scope and routed through an Escalation Path.

13.20.2.1 Ticket Type (Determines "Service Desk Team")

Network Support - governs the proper functioning of servers, containers, stack technologies, network and internet technologies. Network Support is provided 24/7/365 and will typically identify and remediate any concerns before Users are even aware that a need for support existed.
Application Support - addresses defects and feature requests within a COTS, MOTS or Custom Application built on the CitizenDeveloper platform.

Security Information and Event Management (SIEM) combines security information management and security event management to provide real time analysis of security alerts. General (e.g. Billing, Administrative or Other) - all other types of support tickets, usually not having to do with the technical ability of a software application to fulfill its mission.

13.20.2.2 Ticket Urgency/Severity

Tickets are processed based on their Urgency and Type and by being routed to the appropriate Service Desk team. For example, Network Support Tickets that represent an Incident or "Down" are immediately routed to the Network Support Team for a priority response. Conversely, General Service Requests (Critical or Non-Critical) or Application Service Requests (Critical or Non-Critical) are routed to the appropriate team for next business day review and response. Each Team maintains a unique set of classification and escalation processes relevant to their area of support.

All Application Support tickets are classified in a Severity level, which in turn affects our performance under various SLA's. Response and Resolution times for Application Support Tickets are determined primarily by the Tickets Severity, but this can also be determined by its Classification and Tier (see below).

13.20.2.2.1 Down / Incident

Tickets are classified as "Down" when the software does not respond to a web request for a login page.

13.20.2.2.2 Critical

Tickets are classified as "Critical" when User productivity is reduced by greater than 20%.

13.20.2.2.3 Non-Critical

All tickets that are not already classified as "Down" or "Critical" will be classified as "Non-Critical".

13.20.2.3 Ticket Classification for Scope

The text of any software-related support ticket is matched against the underlying statements of work (SoW) that govern the application. The results of that comparison determine the "Scope" of the ticket as follows:

13.20.2.3.1 Defect (aka "Bug")

If the support ticket text describes behavior wherein the Application is not functioning as intended in its current state, then the ticket will be classified as a "Defect". Note that the intended functioning and the current state of the application is itself determined by the SOWs for the application.

13.20.2.3.2 Feature Request

If the support ticket text describes behavior that is not described by the current state of the Application as determined by its SOWs, the ticket will be classified as a "Feature Request".

13.20.2.4 Ticket Escalation Path

Not every ticket can be resolved by the initial support provider and it is possible that some tickets may require reassignment to a different team. In these instances, the initial support provider will immediately escalate the ticket to the supervisory personnel on the correct team, following the processes unique to that team.

All Application Support Tickets begin as "Tier 1" tickets and progress through an escalation path as follows:

13.20.2.4.1 Tier 1 - User Level Support

All Tickets are first reviewed for User error, where the following fundamental question is asked: "Can this Ticket be resolved by training the User?". For example, was the username and password entered properly and did the User access the system? Is the User using a supported web browser? Did the User simply need help with how to use a particular feature or screen?

13.20.2.4.2 Tier 2 - Application Level Support

Upon determining that the ticket can not be resolved with User training, it is immediately escalated to Tier 2. Here, the fundamental question is asked: "If the Application is modified, will the Ticket be resolved?"

13.20.2.4.3 Tier 3 - Platform or Network Support

Upon determining that the ticket can neither be solved with User Training nor Application Modification, the ticket is escalated to Tier 3. Here, the ticket is immediately assigned to support staff for remediation based on its Severity and Scope (see above). Note that most Network Support issues are automatically discovered and remediated by CitizenDeveloper's Network Operations staff, in which case it is not necessary to submit a Support Ticket.

13.20.3 Communication Management

All communications are tracked and managed within the Service Desk Software and are associated with the Ticket, the User, and the Customer.

13.20.4 Reporting

CitizenDeveloper has developed a set of metrics that strikes at the heart of effective IT Service Management, tracks these metrics in real time, and delivers these metrics to the appropriate Team members either at regular intervals or in real time via an online dashboard.

Additionally, CitizenDeveloper software circulates summary metrics to management personnel twice a day via email.

Lastly, CitizenDeveloper management conducts monthly reviews of key metrics and enacts change management activities based on those reviews.

13.20.5 Metrics

Metrics tracked by the Service Management Software include:

Response Time - the elapsed time for the Service Desk to provide an initial response to the User.

Resolution time - the elapsed time for the Service Desk to resolve the ticket.

Slippage - used in the CitizenDeveloper auto-scheduling system, a measure of a particular Support Provider's ability to complete Support related tasks assigned to them in a given time period, usually a day. This metric is a measurement of the Provider's ability to keep up with the automated scheduling system, which itself ensures a high degree of performance against service commitments and SLAs.

Budget Adjustments - each support task has a time budget allotted to it, and Support Providers are required to file time against their assigned support tasks. Budget Adjustments are a measure of a Support Provider's ability to complete their task within the budgeted time frame.

Utilization - An internal measure of a Support Provider's ability to stay focused on designated tasks over time.

13.20.6 The IT Service Management Plan

Unlike a traditional ITSM "annual plan", CitizenDeveloper has adopted what it considers to be a more modern and more effective manufacturing philosophy called "continuous improvement". This has been inspired by the Quality initiatives of Dr. Deming and others and is in accordance with the "Plan, Do, Check, Act" principle.

CitizenDeveloper develops its plans in close coordination with team leaders, suppliers and senior managers. The service needs are documented in the service catalogue which, together with the corresponding policies, forms the basis for all activities. Metric targets are periodically reviewed and refined to provide specific goals and targets for Team performance. Additional individual management activities may be considered such as change advisory boards, process reviews, customer satisfaction surveys, budget planning, or continuity tests. Certain management activities such as process reviews are performed continuously.

13.20.7 Change Management

CitizenDeveloper deploys a continuous improvement model with performance reviews (1) in real time, (2) periodically (for example, twice-a-day emails to management), and (3) monthly in departmental metric reviews. Each metric discussion represents an opportunity for positive change.

Major changes to metric-driven performance targets are set at the executive level based on application of a GE-inspired "moving bell curve" philosophy, which basically states that the elimination of the bottom most performance behaviors and enhancement of the best performance behaviors will result in positive metric improvement over time.

Change Management at CitizenDeveloper is therefore respectfully treated as a continuous process.

13.20.8 Capacity Planning

CitizenDeveloper offers a best-in-class Capacity Management and Capacity Planning capability that leverages the dynamic nature of the containerized microservices environment to mitigate and automate most Capacity Planning needs. Capacity Planning can be effectively addressed by allocating to the Microservice Manager a Max available Hardware and Database Nodes. At any given time, the Microservice Manager will then produce the quantity and mix of microservices best suited to address the dynamics needs of the Users at that moment in time.

13.20.9 Demand Management

As a component of the CitizenDeveloper ITIL Service Strategy, CitizenDeveloper frequently reviews Patterns of Business Activity (PBAs) to identify current customer usage of IT Services as well as anticipating future customer demands for the same. Through review with individuals filling key Demand Management Roles, Demand Prognoses are made and Demand Controls are implemented extensively. CitizenDeveloper relies on a robust list of key performance metrics to aid in the Demand Management process.

13.22Disaster Recovery

13.22.1 What is a Disaster?

A Disaster is generally defined as anything that interrupts the continuous operation of your organization. Disasters are commonly grouped into two types, naturally caused, and human caused.

As you conduct your normal business continuity planning, the phrases "Disaster" and "Disaster Recovery" will commonly refer to all aspects of your organization including facilities access and local communications. However, for this section, all use of those terms will exclusively focus on the Application and its User Data. In addition, the cause of the Disaster is not the focus for this Section.

13.22.2 What is Disaster Recovery?

Disaster Recovery for purposes of this section refers specifically to the continuous operation or restoration to operation of your AW Portal installation in keeping with the commitments provided by your Service Level Agreements (SLA's).

13.22.3 External Factors

Note that "External Factors not Covered by the SLA" are also not covered by this Disaster Recovery plan. A full description of these External Factors are discussed within the SLA, but include all things that are beyond the control of the AW Portal. For example, restoring the Customer's internal networks, computers, and personnel are not the subject of this Disaster Recovery plan.

Put differently, this Disaster Recovery plan facilitates the restoration of your Application, after a disaster, to its previous state of Availability via the internet.

As a final note that may be important to effective Disaster Recovery planning; any server or data storage configurations which are classified as "local", "private cloud", "Customer-designated", or "behind the firewall" may require support from the Customer's technical team in order to execute a complete Disaster Recovery.

13.22.4 Components of Disaster Recovery

To restore complete functionality following a disaster, the following components need to be restored:

- The Server environment
- The AW Portal
- Your Application code
- Your User Data
- Your User Files

Each of these components will receive the focus of specific Disaster Recovery steps.

13.22.5 Traditional Disaster Recovery Concepts

Traditional Disaster Recovery decisions begin with an analysis of the following concepts:

13.22.5.1 Recovery Point Objective (RPO)

Your RPO is a determination of how far back in time you are willing to go to choose a complete data backup to restore. Essentially, it is a measure of how much of your most recent data you are willing to lose in the event of a disaster. It is absolutely critical in traditional Disaster Recovery planning to make this determination based on your organizational needs and resources. Generally speaking, the smaller your RPO, the higher your costs (with the exception of high availability cloud solutions, see below).

RPO Example 1:

RPO = 1 year
Requirement: you only need to take and maintain a cold backup once a year
Cost = almost nothing.

RPO Example 2:

RPO = 1 day
Requirement: you will need to take and maintain a hot backup daily
Cost = low, assuming you already have purchased an enterprise grade database

RPO Example 3:

RPO = <1 minute - traditional solution
Requirement: you will need to purchase and build complex, multi-region, live-failover systems that will run 24/7.
Cost = very high

RPO Example 4:

RPO = <1 minute - cloud based solution
Requirement: you will need to run in a “high availability” cloud-based environment (see below).
Cost = low to moderate

13.22.5.2 Recovery Time Objective (RTO)

Your RTO is a determination of how quickly you will need your environment to be restored in the event of a Disaster. It is essentially a measure of how long your organization can be without the use of the Application. As with the RPO determination, it is absolutely critical in traditional Disaster Recovery planning to make this determination based on your organizational needs and resources. Generally speaking, the smaller your RTO, the higher your costs (with the exception of high availability cloud solutions, see below).

RTO Example 1:

RTO = 1 day (depending on size of your database)
Requirement: you will need a complete set of standby equipment and properly stored images, data backups and code, and all necessary personnel.
Cost = moderate

RTO Example 2:

RTO = <1 minute - traditional solution
Requirement: you will need to purchase and build complex, multi-region, live-failover systems that will run 24/7.
Cost = very high

RTO Example 3:

RTO = <1 minute - cloud based solution
Requirement: you will need to run in a "high" availability cloud-based environment (see below).
Cost = low to moderate

13.22.6 Cloud Disaster Recovery Concepts

13.22.6.1 Redundancy

Redundancy is described as multiple server and data storage environments that overlap, such that if one fails, no data or processing is lost. All high availability systems include some amount of redundancy; however, the reliability of that redundancy in the event of a Disaster is not always the same (see "Zones" and "Regions" below).

Note that all discussion of Cloud-based redundancy architectures already assumes and incorporates traditional concepts of redundancy architectures including RAID drives, redundant power supplies, redundant internet connections etc. Cloud-based redundancy relegates those traditional points of failure as a "given" and instead focuses the discussion on redundancy across server environments such as Zones and Regions (see below).

13.22.6.2 Zone

A Zone is roughly described as multiple redundant systems that remain within a similar geography or sometimes even within a single physical location. When Redundancy is being enjoyed but only from within a single Zone, the entire system is vulnerable to Disasters that affect that geography or that physical location. Historically speaking it is very rare, although it has occurred, that single-zone or "high availability" systems have experienced downtime.

13.22.6.3 Region / Geo-Redundancy

A Region commonly represents multiple zones spread across a very wide spread of geography and physical location. Redundancy that is enjoyed across Regions (aka "Geo-Redundant") exhibits traits of Ultra-High Availability. There are few known instances of multi-region cloud systems experiencing unplanned downtime.

13.22.6.4 Risk Factors with Cloud Architecture

It is unlikely (both theoretically and even historically) that a properly-configured high availability Cloud Application will experience any material downtime, and it is theoretically unnecessary to maintain an aggressive Data Management policy with these architectures. Nevertheless, the AW Portal always maintains recent backups as a precaution, primarily as a bulwark against the behavior of nefarious or negligent actors who have internal access to the systems. For this reason, RPO and RTO determinations remain necessary even when deploying this architecture, although, the effect of "cost" in these determinations drops significantly.

Of note, were there to be a period of Unavailability, there would likely not be a need for a subsequent Disaster Recovery Process, as it is unlikely that data would be lost.

The AW Portal makes the deployment of a high availability architecture easy and very affordable, particularly when selecting a stateless and cloud-only database product that replicates across regions such as Google Cloud Spanner.

13.22.7 Disaster Recovery Process

Regardless of the Availability architecture you choose, the Disaster Recovery Process follows the same general steps. However, the time it takes to perform each of the steps can vary widely by architecture.

In general, you can assume that for a given amount of cost, cloud-based architectures will restore much more quickly than traditional non-cloud architectures.

Additionally, with high availability architectures there should not normally be a need for Disaster Recovery to occur, as no data or functionality should be lost.

13.22.7.1 Step 1: Restore Environment

For a cloud-based architecture, restoring an environment can happen within seconds, and frequently is initiated automatically by the AW Portal NOC software. Environment software such as images and containers are maintained in an Ultra-High Availability environment and are always available 24/7/365 at points across the globe via global CDN.

For a traditional or non-cloud architecture, the time required for this step is largely determined by the type of backup equipment you have available, and the status and skill of the personnel on hand. Environment restoration time in this architecture can vary from minutes to weeks if equipment needs to be purchased.

13.22.7.2 Step 2: Restore Platform

Platform software is maintained in an Ultra-High Availability environment, and is always available 24/7/365 at points across the globe via global CDN.

Platform restoration is always handled automatically by the AW Portal NOC software, and is very fast.

13.22.7.3 Step 3: Restore Application

Application versions may be maintained by the Customer but are also maintained by the AW Portal. The AW Portal Team maintains Application versions using an Ultra-High Availability environment that is always available 24/7/365 at points across the globe via global CDN.

Application restoration is usually handled automatically by the AW Portal software, and is very fast.

13.22.7.4 Step 4: Restore Data

In high availability architectures, Data Restoration is rarely necessary, because Data is usually not lost.

However in all situations where Data Restoration is required, the largest factors affecting Data Restoration times are:

Access to the data
Size of the data
Size of the “pipe” to download the data

In a traditional architecture, Data Restoration times can vary widely from minutes to days depending on the ability to access the data and the size of the data. For example, data stored “offsite on DVD” could take days to access. As another example, downloading very large quantities of Data can take a long time across standard commercial grade internet connections.

With high availability architectures, Data Restoration is replaced by simply reconnecting to the Database, which happens automatically and in a matter of seconds by the AW Portal. However if Data Restoration is required, it is triggered from the AW Portal and happens rapidly by downloading directly from within a private fiber network or using a very large pipe.

13.22.8 Performance Testing

The AW Portal Team regularly reviews and updates its systems technologies including Disaster Recovery processes and tools. Disaster Recovery capabilities are tested periodically throughout a given year, but never less than once per year.

13.23Business Continuity Plan

CitizenDeveloper utilizes business continuity management systems (BCMS) and planning efforts under the guidance of ISO 22301:2012.

13.23.1 Risk Analysis

CitizenDeveloper continuity planning begins with a comprehensive risk analysis. A brief list of Risks addressed by this policy includes:

- Epidemic
- Natural Disaster (Fire, Earthquake, Flood, Hurricane)
- External Cyber attack
- Internal Cyber attack
- Facilities Disruption (Power, Water, Telecommunications, IT)
- Act of War including Terrorism/Piracy
- Theft (insider or external threat, vital information or material)
- Other random failures

13.23.2 Business Impact Analysis

CitizenDeveloper continuity plans are based on a detailed analysis of Impact Scenarios that is updated at least every 5 years as directed by ISO 22301:2012 with more frequent update of certain Critical Functions. This analysis includes distinguishing Critical and Non-Critical business operations. Operations whose disruption is generally regarded as “unacceptable” are considered Critical.

Based on the Business Impact Analysis, a brief summary of Critical Functions, and key recovery mechanisms, are listed below:

13.23.2.1 #1: Client Software and Services

****Client Software and Services stand alone as the absolute top priority for all business continuity planning at CitizenDeveloper.****

By Client, a detailed technology Disaster Recovery Plan including Return Point Objectives (RPO) and Recovery Time Objectives (RTO) is included in separate documentation. A Disaster Recovery SLA is available to each Client. Client Software and Services continuity planning is an executive level function involving the CEO, CIO and the remainder of the executive team.

Client Software and Services continuity plans are evaluated at least quarterly.

13.23.2.2 #2: Company Data

Maintaining company data is considered the 2nd level of priority in the BCMS. As a policy, ALL company data is maintained on an Ultra-High Availability cloud database, and access to it is not dependent on fixed company assets.

13.23.2.3 #3: Company Software

CitizenDeveloper has successfully migrated most business software applications to not less than High Availability Cloud Computing with appropriate Disaster Recovery SLA's and/or RPO's and RTO's in place. There are zero remaining instances of critical company software maintained locally. Remaining local software is non-critical and/or immediately replaceable.

13.23.2.4 #4: Company Knowledge Base

One of the most important company assets is the knowledge of its employees. CitizenDeveloper maintains detailed Standard Operating Procedures (SOP's) and policy managers and team members are required to ensure that their key activities are all mapped in an SOP document. Currently, CitizenDeveloper has approximately a 75% coverage of SOP documentation capturing the collective understanding of tools and processes of the CitizenDeveloper team.

Additionally, all authentication capabilities across accounts, software, and data are maintained and controlled centrally. Highest authentication authorities are maintained at the CEO and CTO levels.

13.23.3 Testing and Verification

Testing and verification is performed periodically to ensure that company systems meet the intended goals of hardness, portability and mobility. The last comprehensive facilities and human capital migration test was performed April 2016, and all RPO/RTO objectives were met. This test addressed most concerns raised by the Risk Analysis and Business Impact Analysis, and it positively addressed each Critical impact concern.

14. SYSTEM SECURITY INFORMATION

14.1 Compliance Enforcement within Applications

The CitizenDeveloper Platform provides a robust set of compliance management and enforcement tools built directly into each application. Together, these tools make it easy to flag software elements subject to compliance monitoring and to report compliance data or alerts at the application or even application-portfolio level.

14.1.1 Compliances

The CitizenDeveloper Platform is architected to track and support most application-level compliance requirements including the tools to support common standards like those of the following:

HIPAA	HIPAA compliance capabilities are natively deployed using The Platform's complete set of tools for encryption, redaction, and encrypted data transmission. All PII and other subjected data, as well as administrative safeguards, are managed within the application and reported centrally as a part of comprehensive compliance audit reporting. Google, our retail cloud services provider, also provides substantial HIPAA protections as described here: https://cloud.google.com/security/compliance/hipaa-compliance/

PCI Security Standards Council	The CitizenDeveloper Platform supports a wide range of payment options including credit cards, campus cards, and electronic checks in a secure and compliant manner. Key compliances including PCI-DSS and PA-DSS are assured through integration with the most respected payment providers. Google, our retail cloud services provider, also provides substantial PCI protections as described here: https://cloud.google.com/security/compliance/pci-dss/

FERPA	In some use cases, application data may include personally identifiable information (PII) from education records that are subject to FERPA ("FERPA Records") and to the extent that they do include FERPA Records managing parties may need to assume the designation of "School Official" (as that term is used in FERPA and its implementing regulations) and therefore must comply with FERPA.

	FERPA compliance capabilities are natively deployed using The Platform's complete set of tools for encryption, redaction, and encrypted data transmission as well as user management utilizing user groups or roles. All personally identifiable information and education records as well as administrative safeguards are managed within the application and reported centrally as a part of comprehensive compliance audit reporting. Google, our retail cloud services provider, also provides substantial FERPA protections as described here: https://cloud.google.com/security/compliance/ferpa/

Sarbanes Oxley (SOX)	Data Privacy Standards Acts (various)	ISO (various)
GDPR	PII	...and many more

14.1.2 Application Compliance Techniques

The CitizenDeveloper Platform makes most components of an application potentially subject to compliance, and enables the ability to predefine a wide range of other monitorable requirements. In general, the components subject to compliance are divided into three categories, with the examples shown below:

Technical Safeguards. These elements are enabled or disabled at the application level but implemented at the platform level (outside of the developers control), and may include;

- Encryption of Data at Rest or in Transit
- Authentication and Auto Log-off

Data Transit Protocols
Record Security
Auditability of Data Elements or Records
Very Strong Passwords
...and more

Data Element Safeguards. All data "Fields" can be made subject to compliance by using a range of techniques:

Redaction
Encryption
Record Security
Auditing
Monitoring and Reporting
Automated tracking of key data field types, e.g. Social Security Fields, Credit Card Fields, Financial Fields etc.
...and more

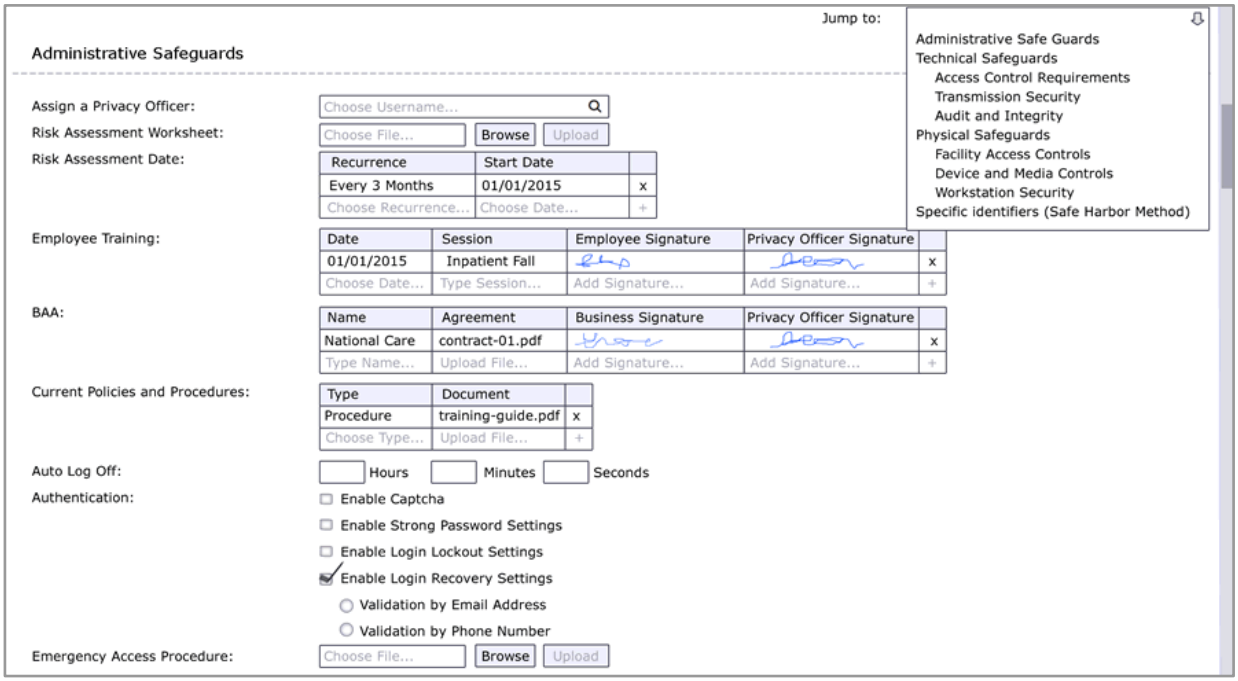
Administrative Safeguards. The CitizenDeveloper Platform allows the setup of administrative checks with periodic renewals and sign offs. The content of these safeguards can cover a wide range of compliance activities. Administrative safeguards report whether or not they've been completed according to the instructions setup. Examples include:

Periodic Reviews
Signoff

14.1.3 Application Compliance Implementation

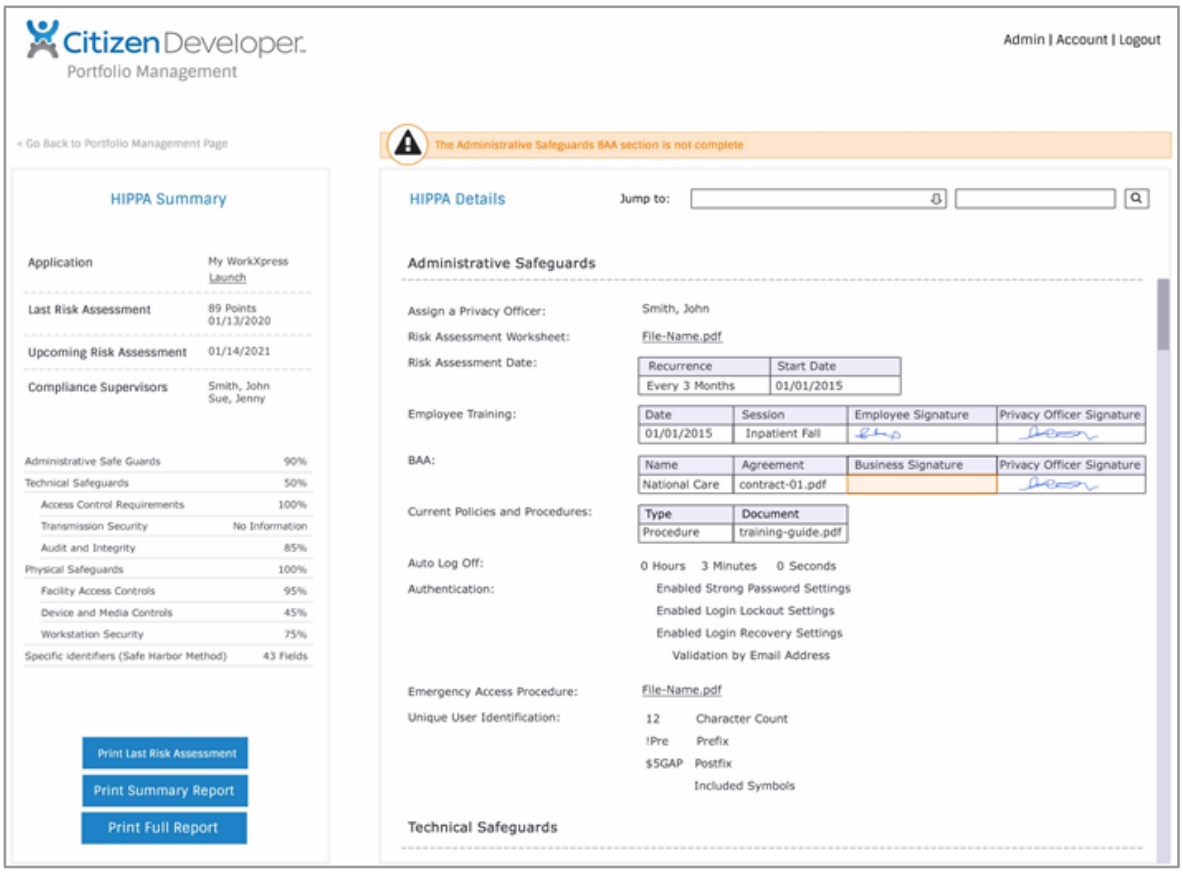
The first step a compliance-minded citizen developer takes is to set up a compliance profile within the application being built. Many profiles are typically pre-defined for a range of common compliance types and come pre-populated with a template of Technical Safeguards, Administrative Requirements, and Data Element Types.

The screen below shows an example of how a common compliance profile, HIPAA, may be setup:



14.1.4 Application Compliance Reporting

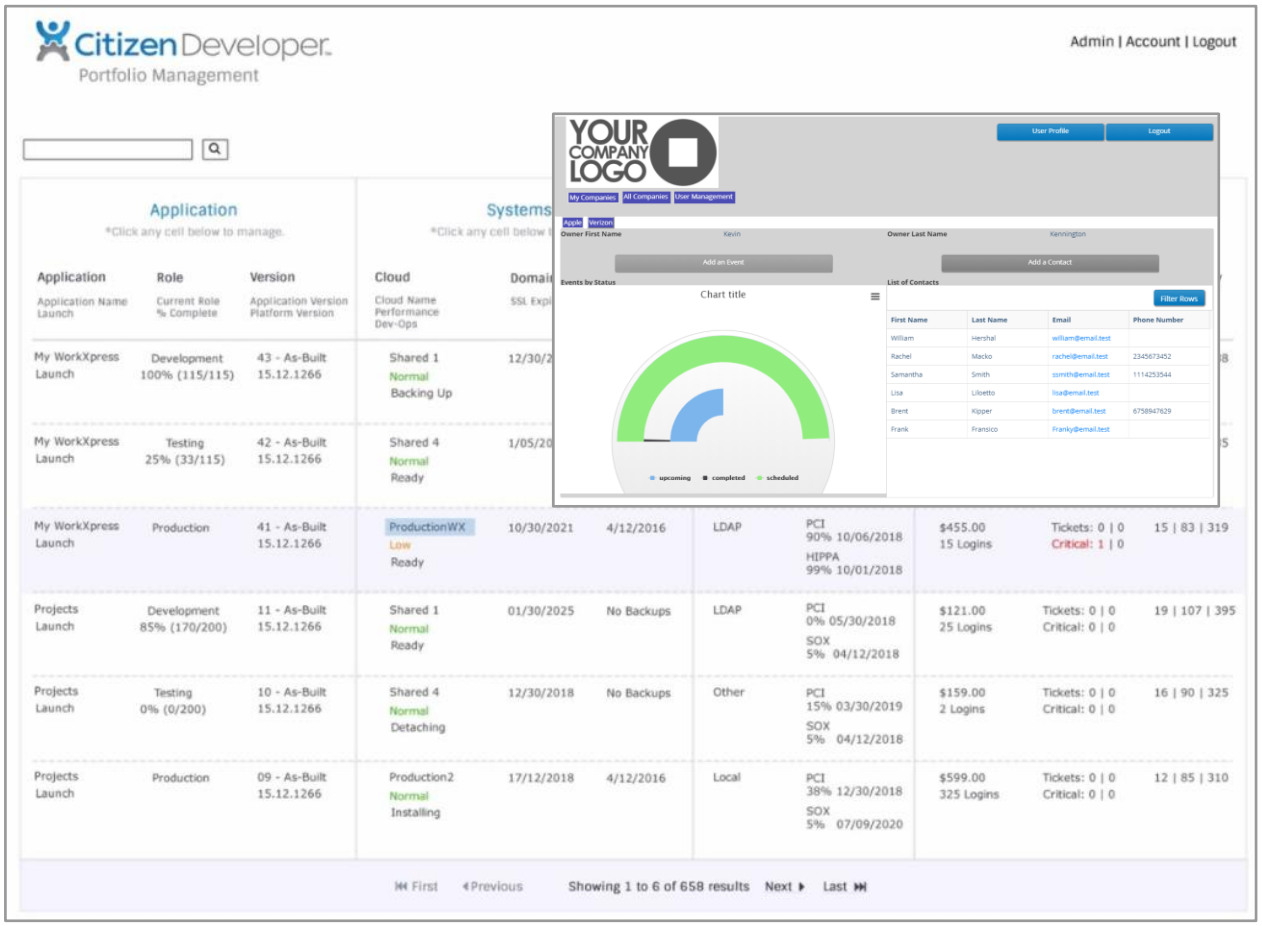
Finally, it is critically important that concise compliance alerts and reporting be generated either at the application level, or more powerfully, at the portfolio level across many applications. This may include setting up warnings or escalations for things such as Administrative Safeguards that are past due. The screenshot below is an example of a Summary Report at the application level:



14.1.5 Portfolio Scale Management of Application Compliance

For IT and Compliance managers with a large application portfolio, compliance represents one of the largest headaches, and one of the largest risks. Inevitably, some application somewhere in a large organization is not meeting compliance standards.

The CitizenDeveloper Platform brings an end to that by aggregating detailed application-level compliance information at the portfolio level. The screenshot below shows a series of applications and information about each one. Note the 3rd section from the left entitled “Security & Compliance”. Here, the compliance manager can receive a summary of any outstanding compliance concerns in a live 24/7 compliance monitoring environment. Importantly, the same manager can, with the click of a button, generate detailed compliance reporting for their auditors or their compliance-conscious customers:

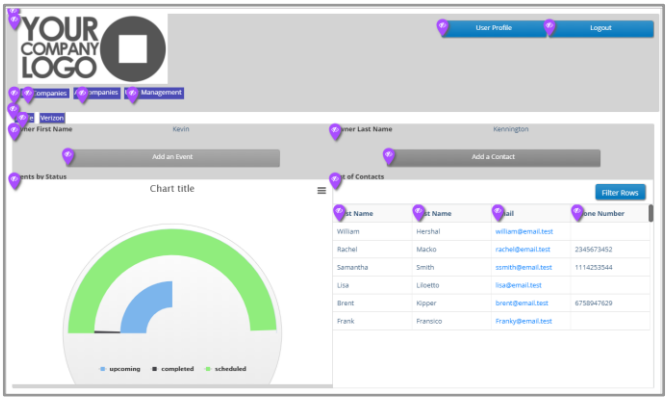


14.1.6 Side Note: Additional Compliance Configuration Tools (no-code)

Once a compliance profile is enabled and appropriate compliance officers are designated, the developer is allowed to begin flagging elements that are subject to compliance. The first screenshot to the right shows a normal application before the compliance overlay is turned on.

Then, the developer enables the compliance overlay, and a series of “map pins” appear anywhere on the page that an element might need to be subject to compliance, as shown in the second screenshot to the right.

The developer is then free to click on any of these pins and designate the technical or administrative safeguards that must be deployed for that application element. For example, if the data element is a Social Security Field, the developer can enable "redaction, encryption in transit, and encryption at rest". Additionally, the developer might enable record security to restrict certain types of records from being available to non-designated users.



14.1.7 Cloud Service Provider Compliance

The selected Cloud Service Provider will also maintain the compliances required by the AW Portal. Our retail Cloud Service Provider offers a robust set of detailed US and International Compliances detailed here https://cloud.google.com/security/compliance/ such as:

HIPAA
Protecting health information. Click here for the covered products and services under the Google Cloud BAA:
https://cloud.google.com/security/compliance/hipaa-compliance/

ISO 27001
Managing information risks.

ISO 27017
Controlling cloud-based information security.

ISO 27018
Protecting personal data.

SOC 1
Controls over financial reporting.

SOC 2
Controls over security, availability, and confidentiality.

SOC 3
Public report of controls over security, availability, and confidentiality.

PCI DSS
Protecting customers' card information.

Sarbanes-Oxley Act (SOX)
Improving the accuracy and reliability of corporate disclosures.

CSA STAR
Securing cloud computing environments.

FedRAMP
Assessment, authorization, and monitoring.

Argentina Personal Data Protection Law 25,326
Argentina Data Privacy & Protection.

Australian Privacy Principles (APP)
Protecting personal information in Australia.

Australian Prudential Regulation Authority (APRA) Standards
Prudential standards for financial services institutions.

COPPA (U.S.)
Protecting children's online privacy.

EU Model Contract Clauses
Contract provisions for complying with the EU Data Protection Directive.

FERPA (U.S.)
Protecting the privacy of student education records.

FIPS 140-2 Validated
FIPS 140-2 Level 1 Certification Implementation for Google Cloud Platform.

FISC (Japan)
Security guidelines for financial institutions in Japan.

GDPR
Support for complying with stronger EU data protection laws.

HITRUST CSF
Industry Agnostic Certification Framework for Regulatory Compliance and Risk Management.

Independent Security Evaluators (ISE) Audit
Secure Tier 1 feature film's workload compliance on GCP.

IRAP Assessed
Security assessment for Australian government users.

The Personal Information Protection and Electronic Documents Act (PIPEDA)
Federal privacy law for private-sector organizations in Canada.

Privacy Shield
A framework for complying with EU Data Protection Directive requirements.

UK NCSC Cloud Security Principles
Security guidelines for evaluating cloud services.

MPAA
Protecting intellectual property data.

MTCS (Singapore) Tier 3
Tier-based cloud security standard.

My Number Act (Japan)
Protecting personal information and data in Japan.

NIST 800-53
Security and privacy requirements for United States Federal information systems.

NIST 800-171
Security requirements for United States Federal controlled unclassified information.

14.3 Client Data Protection

CitizenDeveloper maintains a three-fold "Client Data Protection Strategy" policy for ensuring the confidentiality of Clients' proprietary information, including the highest hiring standards with appropriate personnel clearances, a rigid legal framework binding employees to the desired levels of confidentiality, and physical and digital safeguards that completely separate employees from client-owned intellectual property and data.

14.3.1 Projects subject to Compliance and Security

CitizenDeveloper has deployed hundreds of projects all over the world and subject to a myriad of compliance and regulation standards. CitizenDeveloper software powers secure or confidential operations in a number of highly regulated industries including (Specific references can be provided upon confidential request):

Financial Sector
Healthcare
Insurance
Defense Contracting
...and much more.

14.3.2 Hiring Standards and Clearances

Within limits imposed by the Pennsylvania Criminal History Record Information Act (CHRIA) 18 Pa. C.S.A. § 9101, et seq. and for working with compliance-subject data or intellectual property, CitizenDeveloper prioritizes hiring of individuals with a strong background of granted clearance and access, and with a known history of positive performance, in some cases as determined by Title 28 Code of Federal Regulations Part 20; and Commonwealth Law Enforcement Assistance Network (CLEAN). Employees will be assigned to projects and Clients based on identified security clearance requirements.

14.3.3 Legal Framework Binding Employees

CitizenDeveloper takes very seriously its obligations to protect a Client's secure, confidential, or otherwise proprietary information. To that end, every employee is subject to a rigid legal framework upon hiring that they must execute in order to begin employment. This framework includes the following:

Terms and conditions of employment
Confidentiality Agreements greater than or substantively equal to those executed with Clients.
Intellectual Property Assignment agreements that restrict each employee's ability to pursue economic or intellectual property efforts separate from CitizenDeveloper.
Optional random drug testing
Optional random background checks
Optional random social media checks

14.3.4 Physical and Digital Safeguards

One of the most important aspects of CitizenDeveloper's three-fold Client Data Protection Strategy involves physically and digitally separating employees from a Client's data. Importantly, and by architectural design of the CitizenDeveloper Platform, only a select few individuals possess the physical ability to access a Client's raw production data; no other employees have physical access to that data ("Physical Separation"). However, even among the small team of individuals who could otherwise gain physical access, CitizenDeveloper maintains a strict control policy requiring authorization from both the CTO and CEO in order to receive the access credentials necessary to access a Client's data ("Digital Separation"). CitizenDeveloper centrally maintains all logging to both the access controls and the data stores.

14.5 SIEM

As a response to the needs of large, heavily regulated enterprise users, CitizenDeveloper strives for the highest standards of SIEM available in the industry today. This includes a wide range of overlapping efforts, tools and standards.

14.5.1 Layers of Security

CitizenDeveloper has worked closely with the largest cloud vendors (e.g. Amazon AWS) to react to security alerts and to insure the highest possible standards of data safety and uptime. As a result, the AW Portal will receive multiple layers of security across the complete technology supply chain.

This document focuses on the internal efforts of CitizenDeveloper, but cloud hosted users like AHCCCS can take comfort that the CitizenDeveloper Platform also harnesses the full SIEM resources of the cloud vendor, creating powerful and overlapping layers of security on AHCCCS's behalf.

14.5.2 Scope of Protection

14.5.2.1 Data Stored at Rest

This includes all Databases, User Data, User Files, Data Backups and Archives. Key data subject to compliance regulations will be encrypted at rest.

14.5.2.2 Data in Transit

All Data in Transit is encrypted using https.

14.5.2.3 System Processing

All server-side processes and inter-service communications are managed in a highly secure, encrypted environment.

14.5.2.4 Outside Threats

The CitizenDeveloper Platform follows industry standard procedures to monitor and respond to a wide range of outside threats, including:

Network Anomalies: Service starts/stops, multiple host connects, application crashes, etc.
Account Logon anomalies: Repetitive IPs, etc.
Perimeter Device Anomalies: Recon scans, remote shells, "Grayware", etc.
System Anomalies: Deletions, spikes, network modifications, etc.

14.5.3 Not Secured by Us

14.5.3.1 Private Components

We do not secure the internet, private networks, private clouds, private data storage, the User's network, the User's computer, or the User's browser. Put differently, we only offer security protection on the components of the system that we directly control.

14.5.3.2 Insider Threats

Note that Insider Threats initiated from the user are increasingly common, including a high percentage of remote attacks outside of business hours. The CitizenDeveloper Platform can enable a range of monitors to help identify these incidents and initiate an event process on AHCCCS's behalf.

14.5.4 Our Capabilities

CitizenDeveloper maintains a range of SIEM capabilities, including:

Use of Logs to aggregate data from many sources, including servers, networks, databases and applications.
Attribute Correlation in order to identify meaningful clusters of data indicative of a possible threat.
Alerting.
Forensic analysis at scale, across multiple users and incidents to identify correlations.

14.5.5 Our Tools

SSHGuard and IPTables - When some number of SSH connections have been attempted from an IP address, SSHGuard automatically creates a firewall entry to drop all attempts to reconnect.
TCP Wrappers - IP Ranges pre-determined to be from malicious sources are blocked entirely.
Google Firewall - Only HTTP and HTTPS are allowed from any source (not blocked by other tools), and SSH from authorized sources only. All other traffic from external sources is blocked; spoofed IP address attempts drop to protections using SSHGuard and IPTables.
HTTP traffic is immediately redirected to HTTPS by a proxy, which serves the dual-purpose of protecting the user as well as the services inside the microservice environment.
Port and Vulnerability scans are run using tools such as NMAP and OpenVAS to ensure that known weaknesses are found and addressed.
Company PCs are scanned with antivirus, antimalware, and antispyware software and all network traffic is analyzed for specific markers exhibited by malicious software and attacks.
Company network is protected with an advanced firewall that has very limited, and secured, remote access.

14.5.5.1 Password and Encryption standards

SSL using TLS 1.2 (or greater)
The algorithm we are using is PBKDF2 (https://en.wikipedia.org/wiki/PBKDF2) It is an algorithm recognized and approved by NIST (National Institute of Standards and Technology).
We are currently using 100,000 iterations, the NIST recommendation is 10,000.
We are using a 256 bit cryptographically secure randomly generated salt, the recommendation is at least 64 bits.
For the hashing algorithm we use SHA-512 a NIST approved hashing algorithm
The combination of PBKDF2 and SHA-512 hashing is the combination approved by the Fed Gov't for password hashing.
It takes approximately 1 second to generate a password hash on our systems. Long enough to make brute forcing a list of our passwords extremely expensive (cost and time) while allowing a user to login in a reasonable amount of time.

14.5.6 Audit Performance

CitizenDeveloper systematically performs the following types of Audits. Note that each type of audit is performed on a regular schedule that changes, and is interspersed with random audits:

Client-facing system logs are kept long-term and reviewed monthly for errors and behaviors that are consistent with attacks.
Encryption policies are reviewed quarterly to ensure that required certificates are up to date and cryptographic methods and protocols used are the strongest available at the time.
Access controls are evaluated weekly to ensure that only the correct, valid individuals have access to the specific resources that are required for their daily duties.
Internal computers are scanned to identify whether there are any potentials for breaching client-driven systems. This is a continual, ongoing scan.
Network logs are kept long-term and reviewed monthly for behaviors that are consistent with attacks.
Software development processes are audited for effectiveness in identifying software flaws, including security gaps. This is a continual, ongoing scan.
External audits are performed semiannually using third-party specialists in the security field.

14.5.7 Response Procedures (following NIST 800-61 rev 2)

14.5.7.1 Preparation

CitizenDeveloper performs a range of preparatory activities ranging from regular review of of standards (e.g. NIST) and organizational policies (Center for Information Security (CIS)) to implementation of the latest security tools to regular security meetings with key IS personnel.

The result of this preparatory regimen includes strategic vendor selection, tool selection and implementation, logging, personnel management, SOP and policy implementation.

14.5.7.2 Identification and Classification

Any detected anomaly on a system with our control is classified as an "Event" and is subject to immediate analysis.

14.5.7.2.1 Severity

Events are first grouped according to their severity below:

Normal - any event that does not materially impair operations or affect safety.
Escalation - any event that represents a "critical" impact on the Application's function. Escalated events are immediately brought to the attention of the NOC supervisor.
Emergency - any event that jeopardizes the integrity of stored data, breaches primary controls of the system, violates compliance policies, violates terms under contract with AHCCCS or affects human safety. All Executive Committee personnel (CSO, CEO, etc.) are notified of Emergency events to insure complete organizational cooperation with the containment, eradication, recovery and change management processes.

14.5.7.2.2 Incident

Any Event attributable to human and/or malicious cause is re-classified as an "incident" and is then subject to the Security Addendum SLA. All Incidents require immediate notification and involvement of Security personnel.

14.5.7.3 Containment

All Events classified as Incidents require specific procedural performance as described in the "SIEM Rule to Procedure Matrix", which is summarized by Escalation-classification below:

Rule	Procedure	SLA	Priority
Normal Incidents	Malware Check	8 hours	3
Escalated Incidents	Malware Check, Full Security Review, Change Controls	4 hours	2
Emergency Incidents	Malware Check, Full Security Review, Change Controls, Vendor and Tool Refresh	1 hour	1

14.5.7.4 Eradication

Whereas the Containment step isolates and halts the incident, Eradicate eliminates any root causes from the System. This step is performed, reviewed and audited by the senior IS personnel with a full report and signoff to the CSO.

14.5.7.5 Recovery

After the incident has been eradicated, every reasonable attempt is made to fully restore the systems. In most cases, uses of the system is ongoing and the recovery step is unnecessary. However in most cases, a Change Management step is required (see below).

14.5.8 Change Management

All Escalated and Emergency Incidents require a complete Change Management process with Executive level review and sign-off. Change Management involves additions or enhancements to existing tools, processes or personnel that were a part of the cause-detection-eradication cycle, and can include removal/replacement of Vendors and Products. In other words, for any non-normal incident, and as prescribed by the CitizenDeveloper SIEM policy, proactive changes must occur to prevent future such incidents.

14.5.9 SLA Addendum - Security

CitizenDeveloper stands behind its SIEM practices by offering an SLA Addendum - Security

14.7 Technical Safeguards

By virtue of the AW Portal being built on the CitizenDeveloper Platform, the AW Portal enjoys the benefit of a high level of security based on architecturally designed security features, overlapping and redundant security features with CitizenDeveloper's cloud vendor (Google) as well as a full Security Information and Event Management policy.

14.7.1 Common Attack Vectors

The CitizenDeveloper Platform is architecturally hardened against most common vectors of attack including SQL injection and XSS. As part of this design, there are architectural barriers to code hacks (metadata driven code base). By design, all queries are filtered through Record Security, enforced by the Record Processing microservice. Furthermore, all data is encrypted in transit using SSL using TLS 1.2 (or greater) and when specified, at rest.

14.7.2 Encryption and Passwords

Stored passwords are always secured at rest. The algorithm the CitizenDeveloper Platform uses for password hashing is PBKDF2 (https://en.wikipedia.org/wiki/PBKDF2). It is an algorithm recognized and approved by NIST (National Institute of Standards and Technology). While the NIST recommendation is 10,000 iterations, The CitizenDeveloper Platform is currently using 100,000 iterations of this algorithm. The AW Portal benefits from the use of a 256 bit cryptographically secure randomly generated salt, when the recommendation is at least 64 bits. For the hashing algorithm the CitizenDeveloper Platform uses SHA-512 a NIST approved hashing algorithm. The combination of pbkdf2 and SHA-512 hashing is the combination approved by the Federal Government for password hashing. With respect to password standards utilized, it takes approximately 1 second to generate a password hash on our systems. This amount of time is long enough to make brute forcing a list of our passwords extremely expensive (cost and time) while allowing a user to login in a reasonable amount of time. Our password storage system is versatile, allowing for seamless updates in algorithm choice, iteration and key length as the above standards are phased out and updated.

14.7.2.1 FIPS Compliance

The CitizenDeveloper Platform prioritizes use of FIPS 140-2 validated cryptographic modules for key code components. For example, enablement of FIPS mode within the node.js crypto library.

14.7.3 Data in Transit

The CitizenDeveloper Platform utilizes industry best practices in protecting data while in transit and at rest. Sensitive data in transit is encrypted using HTTPS and SSL.

14.7.4 Data at Rest (Retail Hosting)

Data at rest is protected through the use of Google's robust security protocols, as the data is stored at Google's Data Center.

14.7.5 24/7 Monitors

In addition to the architecturally designed security features, there is overlapping and redundant security monitoring layers including CitizenDeveloper and cloud vendor (Google) that features 24/7 monitoring via NOC. The following redundant security tools are implemented:

SSHGuard and IPTables - When some number of SSH connections have been attempted from an IP address, SSHGuard automatically creates a firewall entry to drop all attempts to reconnect.

TCP Wrappers - IP Ranges pre-determined to be from malicious sources are blocked entirely.

Google Firewall - Only HTTP and HTTPS are allowed from any source (not blocked by other tools), and SSH from authorized sources only. All other traffic from external sources is blocked; spoofed IP address attempts drop to protections using SSHGuard and IPTables.

HTTP traffic is immediately redirected to HTTPS by a proxy, which serves the dual-purpose of protecting the user as well as the services inside the microservice environment.

Port and Vulnerability scans are run using tools such as NMAP and OpenVAS to ensure that known weaknesses are found and addressed.

Company PCs are scanned with antivirus, antimalware, and antispyware software and all network traffic is analyzed for specific markers exhibited by malicious software and attacks.

Company network is protected with an advanced firewall that has very limited, and multi-factor secured, remote access.

14.7.6 Security Information and Event Management (SIEM)

As part of the security protocol, the AW Portal comes complete with a full SIEM policy including:

Network Anomalies: Service starts/stops, multiple host connects, application crashes, etc.

Account Logon anomalies: Repetitive IPs, etc.

Perimeter Device Anomalies: Recon scans, remote shells, “Grayware”, etc.

System Anomalies: Deletions, spikes, network modifications, etc.

Use of Logs to aggregate data from many sources, including servers, networks, databases and applications.

Attribute Correlation in order to identify meaningful clusters of data indicative of a possible threat.

Alerting.

Forensic analysis at scale, across multiple customers and incidents to identify correlations.

14.7.7 Security SLA

In support of the aforementioned security information, CitizenDeveloper offers a Security SLA that outlines and memorializes the security afforded to the AW Portal.

15. APPENDIX B - SERVICE LEVEL AGREEMENTS

15.1 SLA - Availability

Last Modified: November 20, 2018

15.1.1 Introduction

This Service Level Agreement (SLA) is provided to assure Clients that their software will always perform consistently and at peak levels.

15.1.2 SLA

During the Term of the Agreement for the Covered Service (as applicable, the "Agreement"), the Covered Service will provide the Metrics to Customer as specified in the table below (collectively, the "Service Level Objective " or "SLO"). If CitizenDeveloper does not meet the SLO, and if Customer meets its obligations under this SLA, Customer will be eligible to receive the Financial Credits described for the period of Unavailability. This SLA states Customer's sole and exclusive remedy for any failure by CitizenDeveloper to meet the SLO. Capitalized terms used in this SLA, but not defined in this SLA, have the meaning set forth in the Agreement. If the Agreement is the CitizenDeveloper Platform Reseller Agreement, then all references to Customer in this SLA mean Reseller, and any Financial Credit(s) will only apply for impacted Reseller order(s) under the Agreement. CitizenDeveloper utilizes third party services to meet the SLO outlined. CitizenDeveloper reserves the right to change third party service providers to provide the same or better SLO.

SKU	SLA	Metric	Remedy
A4000.1	Standard Availability	99.5% (Two-and-a-half nine's) Monthly	Financial Credits
A4000.2	High Availability (optional)	99.99% (four nine's) Monthly	Financial Credits
A4000.3	Ultra High Availability (optional)	99.999% (five nine's) Monthly	Financial Credits
all	Response Time	< 15 minutes inside of business hours < 30 minutes outside of business hours	Financial Credits

all	Resolution Time	<60 minutes inside of business hours <120 minutes outside of business hours	Financial Credits

15.1.2.1 Definitions and Terms

15.1.2.1.1 Covered Service

Covered service includes instances hosted as part of the CitizenDeveloper Compute Engine Service.

15.1.2.1.2 Uptime

Uptime refers to the target server's ability to receive and process an input, typically a request from the internet.

15.1.2.1.3 Downtime

Downtime is the opposite of Uptime, and it occurs when a target server is unable to receive an input from the internet.

15.1.2.1.4 Availability

Availability refers to a specific service's ability to process an input. In this case, the specific service is the CitizenDeveloper Application governed by this SLA, and it has Availability during a period of Uptime when it is able to process some User request and return a result.

There are three levels of Availability SLA, Standard, High Availability, and Ultra High Availability. Unless otherwise stated in an Order, your SLA is for Standard Availability.

Note that the nature of the result returned is a function of the features of the software application itself. Therefore, while the existence of the result is covered by this SLA, its characteristics or qualities are not. Additionally, a perceived lack of Availability caused by the natural and intended behavior (including "bugs") of a software Application (for example an application that invokes an unprotected infinite loop, or an application that generates inordinate requests for the resources it is assigned) does not constitute a period of Unavailability, as the application is functioning as it was configured to.

15.1.2.1.5 Unavailability

Unavailability is the opposite of Availability, and occurs during a period of Uptime when the CitizenDeveloper Application governed by this SLA is not able to receive some User request or to return some User result.

15.1.2.1.6 Planned Maintenance

Planned Maintenance is an important part of the SLA as it allows the Client to receive the most recent patches and updates and to maintain the highest levels of performance, security and compliance.

Planned Maintenance requires advance notice, is typically scheduled during periods of minimum usage, and is not counted as Downtime or Unavailability.

15.1.2.1.7 Unplanned Maintenance

From time to time during a period of Uptime, emergency maintenance will be required to maintain the highest levels of performance, security and compliance. This Unplanned Maintenance does not require advance notice, could be scheduled at any time but is usually scheduled during periods of minimum usage, and is counted as Unavailability.

15.1.2.1.8 Response Time

During a period of Unavailability, Response time represents the time it takes for a CitizenDeveloper support team member to identify the Unavailability and to initiate a Resolution process. Response time is calculated using the following formula:

Response Time = Time Resolution Begins - Time Unavailability Began

15.1.2.1.9 Resolution Time

During a period of Unavailability (or other deficient metric), Resolution time represents the time it takes for a CitizenDeveloper support team member to restore Availability (or other deficient metric). It is calculated using the following formula:

Resolution Time = Time Metric is Restored - Time Metric Became Deficient

15.1.2.1.10 Metric

Metrics are either performing or for some period of time they may be underperforming. Underperforming Metrics are addressed by the SLA and may entitle the Customer to a Remedy.

15.1.2.1.11 % Percentage Availability Metric (or % Percentage Uptime)

Frequently, Uptime and/or Availability Metrics are expressed as a ratio or a percentage as described below (example provided for Uptime and Downtime; also substitute the phrase “Availability” for “Uptime” and “Unavailability” for “Downtime”):

Uptime %	Downtime per year	Downtime per month	Downtime per week	Downtime per day
90% ("one nine")	36.5 days	72 hours	16.8 hours	2.4 hours
95% ("one and a half nines")	18.25 days	36 hours	8.4 hours	1.2 hours

97%	10.96 days	21.6 hours	5.04 hours	43.2 minutes
98%	7.30 days	14.4 hours	3.36 hours	28.8 minutes
99% ("two nines")	3.65 days	7.20 hours	1.68 hours	14.4 minutes
99.5% ("two and a half nines")	1.83 days	3.60 hours	50.4 minutes	7.2 minutes
99.8%	17.52 hours	86.23 minutes	20.16 minutes	2.88 minutes
99.9% ("three nines")	8.76 hours	43.8 minutes	10.1 minutes	1.44 minutes
99.95% ("three and a half nines")	4.38 hours	21.56 minutes	5.04 minutes	43.2 seconds
99.99% ("four nines")	52.56 minutes	4.38 minutes	1.01 minutes	8.64 seconds
99.999% ("five nines")	5.26 minutes	25.9 seconds	6.05 seconds	864.3 milliseconds

15.1.2.1.12 Remedy

Remedies are the benefits provided to the Client as a result of an underperformance that is covered by this SLA. For any period of Unavailability, there are two possible Remedies;

The products and services necessary to restore Availability

Financial Credits for periods of excessive Unavailability

15.1.2.1.13 Customer Must Request Financial Credit

In order to receive any of the Financial Credits described above, Customer must notify CitizenDeveloper technical support within ten days from the time Customer becomes eligible to receive a Financial Credit. Customer must also provide CitizenDeveloper with server log files showing loss of external connectivity errors or other SLA metrics and the date and time those errors occurred. If Customer does not comply with these requirements, Customer will forfeit its right to receive a

Financial Credit. If a dispute arises with respect to an SLA, CitizenDeveloper will make a determination in good faith based on its system logs, monitoring reports, configuration records, and other available information, which CitizenDeveloper will make available for auditing by Customer at Customer's request.

15.1.2.1.14 Financial Credit Calculation

The Financial Credit will be calculated as follows:

Amount Due for Covered Service for Period * Resolution Time within Period / Duration of Period

Note that Financial Credits do not "stack" across multiple metrics or multiple SLA's during any period of underperformance. In other words, if multiple metrics underperform at the same time, the Financial Credit will only be calculated once as a Remedy for all of the simultaneously underperforming metrics. The aggregate maximum number of Financial Credits to be issued by CitizenDeveloper to Customer for any and all underperforming Periods that occur in a single specified period will not exceed 50% of the amount due by Customer for the Covered Service for the applicable period. Financial Credits will be made in the form of a monetary credit applied to future use of the Service and will be applied within 60 days after the Financial Credit was requested.

15.1.2.1.15 SLA Exclusions

The SLA does not apply to any: (a) features designated Alpha or Beta (unless otherwise set forth in the associated Documentation), (b) features excluded from the SLA (in the associated Documentation), or (c) errors: (i) caused by factors outside of CitizenDeveloper's reasonable control; (ii) that resulted from Customer's software or hardware or third party software or hardware, or both; (iii) that resulted from abuses or other behaviors that violate the Agreement; or (iv) that resulted from quotas applied by the system and/or listed in the CitizenDeveloper tools. A complete detailing of SLA Exclusions can be found at https//www.citizendeveloper.com/legal and are hereby fully incorporated herein as the list of SLA Exclusions applicable to this Agreement.

15.2 SLA - Security

Last Modified: November 20, 2018

This Addendum to the Service Level Agreement (SLA) is provided to assure Clients that their software will always perform consistently and at peak levels.

Most Vendors provide only an Uptime SLA and/or an Availability SLA, and as a result, security issues perceived by the Customer are frequently not covered. CitizenDeveloper addresses these concerns through an additional level of protection for the Client, an Application Security SLA Addendum that covers performance against a wide range of Security Incidents and subsequent Change Management efforts to insure that the Incident is fully understood and not repeated.

15.2.1 SLA Terms

This SLA exists as an Addendum to the Service Level Agreement (SLA) - Availability, and is subject to the terms and conditions therein.

During the Term of the Agreement for the Covered Service (as applicable, the "Agreement") and during any period of Availability, the Covered Service will provide the Metrics to Customer as specified in the table below (collectively, the "Service Level Objective " or "SLO"). If CitizenDeveloper does not meet the SLO, and if Customer meets its obligations under this SLA, Customer will be eligible to receive the Financial Credits described for the period of underperformance. This SLA Addendum states Customer's sole and exclusive remedy for any failure by CitizenDeveloper to meet the SLO. Capitalized terms used in this SLA, but not defined in this SLA, have the meaning set forth in the Agreement. If the Agreement is the CitizenDeveloper Platform Reseller Agreement, then all references to Customer in this SLA mean Reseller, and any Financial Credit(s) will only apply for impacted Reseller order(s) under the Agreement.

SKU	SLA	Metric	Remedy
4200.1 4200.2 4200.3	Normal Incidents	Malware Check - 8 hours	Financial Credits
4200.2 4200.3	Escalated Incidents	Malware Check - 4 hours Full Security Review - 8 hours Change Controls - 48 hours	Financial Credits
4200.3	Emergency Incidents	Malware Check - 1 hour Full Security Review - 4 hours Change Controls - 24 hours Vendor and Tool Refresh - top priority	Financial Credits

15.2.1.1 Definitions and Terms

15.2.1.1.1 Event

During a period of Availability, any detected anomaly on a system within CitizenDeveloper's root level control is classified as an "Event" and is subject to immediate analysis.

15.2.1.1.2 Normal Incident

Any event attributable to human and/or malicious cause that does not materially impair operations or affect safety.

15.2.1.1.3 Escalated Incident

Any event attributable to human and/or malicious cause that represents a “critical” impact on the Application’s function. Escalated events are immediately brought to the attention of the NOC supervisor.

15.2.1.1.4 Emergency Incident

Any event attributable to human and/or malicious cause that jeopardizes the integrity of stored data, breaches primary controls of the system, violates compliance policies, violates terms under contract with customer, or affects human safety. All Executive Committee personnel (CSO, CEO, etc.) are notified of Emergency events to insure complete organizational cooperation with the containment, eradication, recovery and change management processes.

15.3 SLA - Performance

Last Modified: November 20, 2018

This Addendum to the Service Level Agreement (SLA) is provided to assure Clients that their software will always perform consistently and at peak levels.

Most Vendors provide only an Uptime SLA and/or an Availability SLA, and as a result, performance issues perceived by the User are frequently not covered by those SLA’s. In fact, there are a wide range of both Uptime and Availability scenarios in which a User’s perceived performance can still feel degraded but for which no response, resolution or remedy under an SLA applies. CitizenDeveloper addresses these concerns through an additional level of protection for the Client, an Application Performance SLA Addendum, that covers the common performance offenders below. Do not be misled - If the below offenders are not specifically addressed by an SLA, then there is no assurance of “good performance” by that application:

IOPS (Server Disk Input/Output)
Throughput
Transactions per Minute
Page Response Time

15.3.1 SLA Terms

This SLA exists as an Addendum to the Service Level Agreement (SLA) - Availability, and is subject to the terms and conditions therein.

During the Term of the Agreement for the Covered Service (as applicable, the "Agreement") and during any period of Availability, the Covered Service will provide the Metrics to Customer as specified in the table below (collectively, the “Service Level Objective ” or “SLO”). If CitizenDeveloper

does not meet the SLO, and if Customer meets its obligations under this SLA, Customer will be eligible to receive the Financial Credits described for the period of underperformance. This SLA Addendum states Customer's sole and exclusive remedy for any failure by CitizenDeveloper to meet the SLO. Capitalized terms used in this SLA, but not defined in this SLA, have the meaning set forth in the Agreement. If the Agreement is the CitizenDeveloper Platform Reseller Agreement, then all references to Customer in this SLA mean Reseller, and any Financial Credit(s) will only apply for impacted Reseller order(s) under the Agreement.

SKU	SLA	Metric	Remedy
A4100.3	Maximum IOPS (Server Disk Input/Output)	Read IOPS per GB: 30 Write IOPS per GB: 30 Read IOPS per Instance: 25,000 Write IOPS per Instance: 25,000	Financial Credits
A4100.3	Maximum Throughput	Read Throughput per GB: 0.48 MB/s Write Throughput per GB: 0.48 MB/s Read Throughput per Instance: 240 MB/s Write Throughput per Instance: 240 MB/s	Financial Credits
A4100.3	Maximum Transactions per Minute	Read Transactions: 360,000 Write Transactions: 120,000	Financial Credits
A4100.2 A4100.3	Page Response Time	HTTPS average Simple Page Load time: 1.7 seconds	Financial Credits
A4100.1 A4100.2 A4100.3	Response Time	1 business day	Financial Credits
A4100.1 A4100.2 A4100.3	Resolution Time	2 business days	Financial Credits

15.3.1.1 Definitions and Terms

15.3.1.1.1 IOPS

For small reads and writes, where the limiting factor is random input/output operations per second IOPS.

15.3.1.1.2 Throughput

For large reads and writes, where the limiting factor is throughput.

15.3.1.1.3 Transactions per Minute

The ability of the Server to process data transactions.

15.3.1.1.4 Page Response Time

Pages may be designed by the Customer to incorporate a vast range of content, automation and complexity. Pages can be very simple and require little in the way of data or calculation, or Pages can be very large, require significant amounts data, and command significant processing resources in order to produce. For this reason, there is no reasonable way to guarantee that all of a Customer's pages will load in a specific time period, unless the guarantor is given the right to modify the content of the pages themself; of course, this is unacceptable for most Customers. Therefore, this SLA calculates Page Response Time by looking at a "Simple" Page as designated by CitizenDeveloper, which is either a standard test page included within the application, or could be a generic authentication page or administration page. Also note that Page Response Time will be calculated as an average of ten load attempts, with the first three load attempts removed from the calculation. Lastly Page Response Time does not apply when IOPS, Throughput or Transactions as defined above are the limiting performance factor as they are covered under their respective terms.

15.4SLA - Software Application Support

Last Modified: November 20, 2018

This Addendum to the Service Level Agreement (SLA) is provided to assure Clients that their software will always function consistently and as intended by the developers.

Most Vendors provide only an Uptime SLA and/or an Availability SLA, and as a result, software support issues experienced by the User are frequently not covered by those SLAs. In fact, there are a wide range of both Uptime and Availability scenarios in which a User's perceived functionality can still feel degraded but for which no response, resolution or remedy under an SLA applies. CitizenDeveloper addresses these concerns through an additional level of protection for the Client, an Application Software Support SLA Addendum, that covers the common support needs listed below.

Do not be misled - If the below offenders are not specifically addressed by an SLA, then there is no assurance of "correct functionality" of that application:

Tier 1, Tier 2 and Tier 3 defect resolution
Critical, Major, Minor, Trivial response and resolution times

15.4.1 SLA Terms

This SLA exists as an Addendum to the Service Level Agreement (SLA) - Availability, and is subject to the terms and conditions therein.

During the Term of the Agreement for the Covered Service (as applicable, the "Agreement") and during any period of Availability, the Covered Service will provide the Metrics to Customer as specified in the table below (collectively, the "Service Level Objective " or "SLO"). If CitizenDeveloper does not meet the SLO, and if Customer meets its obligations under this SLA, Customer will be eligible to receive the Financial Credits described for the period of underperformance. This SLA Addendum states Customer's sole and exclusive remedy for any failure by CitizenDeveloper to meet the SLO. Capitalized terms used in this SLA, but not defined in this SLA, have the meaning set forth in the Agreement. If the Agreement is the CitizenDeveloper Platform Reseller Agreement, then all references to Customer in this SLA mean Reseller, and any Financial Credit(s) will only apply for impacted Reseller order(s) under the Agreement.

SKU	SLA	Metric	Remedy
A4400.1	Defect Response Time		
	Trivial - Tier 1,2,3	As per separate Order document	
	Minor - Tier 1,2,3	2 business days	Financial Credits
	Major - Tier 1,2,3	1 business day	Financial Credits
	Critical - Tier 1,2,3	2 hours	Financial Credits
A4400.1	Defect Resolution Time		
	Trivial -	As per separate Order document	

	Tier 1,2,3		
	Minor - Tier 1,2,3	3 business days	Financial Credits
	Major - Tier 1,2,3	1 business day	Financial Credits
	Critical - Tier 1,2,3	1 day	Financial Credits

15.4.1.1 Definitions and Terms

15.4.1.1.1 Defect

During a period of Uptime and Availability, If the support ticket text describes behavior wherein the Application is not functioning as described by a specifically agreed upon Statement of Work; and the cause of the non-functioning is not the subject of another SLA (including but not limited to Security, Page Performance, Availability, etc.), then the ticket will be classified as a “Defect”.

15.4.1.1.2 Tier 1 - User Support

All Tickets for which the following fundamental question is true: “Can this Ticket be resolved by training the User?”.

15.4.1.1.3 Tier 2 - Application Support

All Tickets for which the following fundamental question is true: “If the Application metadata is modified, will the Ticket be resolved?”

15.4.1.1.4 Tier 3 - Platform Support

All Tickets that require modification to the CitizenDeveloper platform.

15.4.1.1.5 Severity - Critical

Affects critical functionality or critical data. Does not have a workaround. Also referred to as the application being “down”.

15.4.1.1.6 Severity - Major

Affects major functionality or major data. Does have a workaround, but that workaround is not obvious and is difficult.

15.4.1.1.7 Severity - Minor

Affects minor functionality or non-critical data, and/or it has an easy workaround.

15.4.1.1.8 Severity - Trivial

Does not affect current functionality or data.

15.4.1.1.9 Response and Resolution Time Calculation

Note that Response and Resolution times for defect handling begin at the point where a Ticket is properly submitted with a complete description of the support need including Severity and Tier designations as determined in the sole discretion of CitizenDeveloper. These times do not accrue or elapse until the necessary resolution information has been provided to both classify and resolve the ticket.

15.5 SLA - Disaster Recovery

Last Modified: November 20, 2018

This Addendum to the Service Level Agreement (SLA) is provided to assure Clients that in the event of a major disaster their software will quickly return to peak operating status.

Most Vendors provide only an Uptime SLA and/or an Availability SLA, and as a result, disaster recovery issues perceived by the Customer are frequently not covered. CitizenDeveloper addresses these concerns through an additional level of protection for the Client, a Disaster Recovery SLA Addendum, that covers restoration after a wide range of disastrous incidents.

15.5.1 SLA Terms

This SLA exists as an Addendum to the Service Level Agreement (SLA) - Availability, and is subject to the terms and conditions therein.

During the Term of the Agreement for the Covered Service (as applicable, the "Agreement") and in the event of a critical system shutdown resulting from some natural or man-made disaster, the Covered Service will provide the Metrics to Customer as specified in the table below (collectively, the “Service Level Objective ” or “SLO”). If CitizenDeveloper does not meet the SLO, and if Customer meets its obligations under this SLA, Customer will be eligible to receive the Financial Credits described for the period of underperformance. This SLA Addendum states Customer’s sole and exclusive remedy for any failure by CitizenDeveloper to meet the SLO. Capitalized terms used in this SLA, but not defined in this SLA, have the meaning set forth in the Agreement. If the Agreement is the CitizenDeveloper Platform Reseller Agreement, then all references to Customer in this SLA mean Reseller, and any Financial Credit(s) will only apply for impacted Reseller order(s) under the Agreement.

SKU	SLA	Metric	Remedy

A4300.1	Recovery Point Objective	Local System, Local Backups - No remedy Local System, UHA Backups - Last successful backup CD Managed UHA System - Point of Outage or Last successful backup	Financial Credits
A4300.1	Recovery Time Objective	Local System, Local Backups - No remedy Local System, UHA Backups - Immediate availability for retrieval by Client CD Managed UHA System - Begin recovery immediately, complete within 1 hour.	Financial Credits

15.5.1.1 Definitions and Terms

15.5.1.1.1 Recovery Point Objective (RPO)

Your RPO is a determination of how far back in time you are willing to go to choose a complete data backup to restore. Essentially, it is a measure of how much of your most recent data you are willing to lose in the event of a disaster.

15.5.1.1.2 Recovery Time Objective (RTO)

Your RTO is a determination of how quickly you will need your environment restored in the event of a Disaster. It is essentially a measure of how long your organization can be without use of the Application.

15.5.1.1.3 Local

Any system that is managed or maintained by the Client will not receive a remedy under this SLA.

15.5.1.1.4 CitizenDeveloper (CD) Managed Ultra High Availability

Any geo-redundant system managed and maintained by CitizenDeveloper on behalf of the Client. The goal for UHA systems are (a) no periods of unavailability and (b) no possibility of disaster (except for malicious intent).

15.5.1.1.5 Disaster

During a period of Availability, any natural or man-made incident resulting in a critical failure of software availability.

15.6 SLA - Exclusions

Last Modified: December 10, 2018

15.6.1 Many Contributing Factors

There are many factors that contribute to or affect an application's availability, speed, functionality, security and other characteristics that may normally be subject to an SLA. Those factors that can be controlled by CitizenDeveloper or its Vendors are generally covered by the appropriate Service Level Agreement (SLA).

15.6.2 Not Covered by SLA

Some factors that affect the end-user experiences can not reasonably be controlled by a Vendor and therefore can not reasonably be covered by an SLA. For example, if the Client is running their application on a slow computer or across a slow internal network, the application may perform more slowly. SLA deficiencies caused by factors such as these are not subject to any SLA remedy.

15.6.3 SLA Focuses on Factors Controllable by Provider

All SLA performance factors are provider-only, meaning that they pertain to factors reasonably controlled by the provider. For example, in a cloud hosted environment the provider controls how the application is provided to the internet, but, the provider does not control how the application is received from the internet or processed by the Client. In all cases, Client-facing performance values in the SLA presume that the Client is using currently Supported Client Technologies described at https://www.citizendeveloper.com/legal, that they are running at reasonable performance levels, and that only provider-centric factors are deficient.

15.6.4 Factors Covered by the SLA

15.6.4.1 CitizenDeveloper Facilitated Cloud Servers

All modern cloud-based web applications are powered by computers known as "Servers". These computers can be physical or virtual and can come in a variety of configurations and sizes. Cloud Servers directly impact the performance of the Client's application and are covered within the SLA when utilizing Cloud Servers that are facilitated by CitizenDeveloper.

15.6.4.2 Software Performance on Cloud Servers

Software is processed by the Server, and its performance is directly attributable to the efficiency with which it was written, the language it was written in, and volume that is demanded from it by the Users. Server Software Performance is covered within the appropriate SLA.

15.6.4.3 Cloud Server-side Network

Cloud Server Software runs on Servers that sit behind a Network. The Network can include a wide range of routers and switches, network connections, firewalls, and more. These components are covered within the appropriate SLA on Clouds facilitated by CitizenDeveloper.

15.6.4.4 Cloud Server-side Connection to Internet

Once Web Server Software is processed, the Server sends it to the User through the Internet. The Server's connection to the Internet can be a factor in Application Performance. The Server-side Connection to the Internet is covered within the appropriate SLA for CitizenDeveloper-facilitated Clouds.

15.6.4.5 Software Performance on Supported Browsers and Hardware

Software must be written efficiently for the target browser to perform well. Additionally, a supported browser must be used, and it must be ran on performing hardware. Supported Client Technologies are detailed at https://www.citizendeveloper.com/legal and are necessary for coverage by the appropriate SLA.

15.6.5 Factors Not Covered by the SLA

15.6.5.1 Internet

Internet performance is not covered by the SLA.

15.6.5.2 Client Managed Servers

Servers such as Private Cloud servers that are under management of the Client or their chosen 3rd Party Vendor are not covered by the SLA.

15.6.5.3 Client Managed Server-Side Networks

Networks managed by the Client or their chosen 3rd Party Vendor are not covered by the SLA.

15.6.5.4 Client Managed Server-Side Internet

Server-side Internet connections managed by the Client or their chosen 3rd Party Vendor are not covered by the SLA.

15.6.5.5 Users Internet

Client-side Internet connections managed by the Client or their chosen 3rd Party Vendor are not covered by the SLA.

15.6.5.6 Users Network

Network performance on networks managed by the Client or their chosen 3rd Party Vendor are not covered by the SLA.

15.6.5.7 Users Computer

Deficient performance by the User's computer is not covered by the SLA.

15.6.5.8 Users Browser

Deficient browsers used by the User to run the Application are not covered by the SLA.

15.6.5.9 Specific Application Features

Application Users enjoy a wide range of features, but applications can also exhibit undesired features or bugs. These characteristics of the application itself, whether desired or undesired, are not covered by this SLA. Direct consequences of these features, such as undesired behavior of servers, networks, vendor actions etc., are also not covered by this SLA.