

INTERNAL AUDIT

Advisory Memorandum

Cloud Migration Project
Progress Report

August 25, 2021





Advisory Memorandum

Background

Citizens has adopted a Cloud Strategy which includes a transition from hosting its own infrastructure on premises in a leased datacenter, to hosting applications and infrastructure in the cloud. A phased approach is being used to implement the Cloud Strategy over a five-year period.

Citizens' cloud preference is to utilize Software-as-a-Service (SaaS), in which the software and its supporting infrastructure are provided and managed by the software provider. Several SaaS applications have already been implemented including Centerpoint, Clearinghouse, Microsoft Office365, myService, and the new agency management system, myAgency. Additional Microsoft applications are underway or planned, including One Drive and SharePoint, which will facilitate file storage.

Presently, not all of Citizens' software vendors provide cloud-based versions. Cloud-based versions make take several years to become available and some software may not be migratable. Citizens has determined that until then, immediate cloud benefits can be realized by migrating substantially all on-premises solutions to a cloud service known as Infrastructure-as-a-Service (IaaS). IaaS is a type of cloud computing service that offers essential compute, storage, and networking resources on demand, on a pay-as-you-go basis. A cloud computing service provider manages the infrastructure, while the customer purchases, installs, configures, and manages its own software, including operating systems, middleware, and applications.

Switching to the use of IaaS in the cloud will allow Citizens to eliminate the need to maintain excess capacity and the related cost and meet rapid increases in demand by being able to immediately activate as much additional capacity as needed for whatever business situation arises. This flexibility is the primary driver for Citizens' transition to the cloud. On premises applications are currently being migrated to the cloud using IaaS, beginning with the development environments. A very small number of systems which will not migrate to the cloud will be operated on Citizens owned and managed infrastructure located in leased rack space in a colocation facility.

Objectives and Scope

Internal Audit (Audit) was asked to support the project in an advisory capacity. Audit is providing insight related to risks and controls associated with the migration of applications and infrastructure to cloud services. Audit's participation is focused on evaluating:

- Project governance, including the management framework within which project decisions are made
- Design and implementation of new or enhanced policies, operational procedures, monitoring, and reporting where required
- Completion and soundness of significant project artifacts which provide an internal control structure for the migration of applications and infrastructure to the cloud
- Testing of new controls based upon risk or as requested by the project team



Advisory Memorandum

Progress Report

- The project governance structure is well designed with an effective escalation and approval path and monthly updates to stakeholders.
- Turnover occurred at the project manager level with no project disruption.
- Formal communications and training are provided to employees for cloud initiatives that affect the overall company, such as the migration of employee documents to One Drive.
- The migration of employee documents to One Drive was successfully kicked off and employees are copying personal files to the new storage location.
- Several application development environments have been migrated to Azure including Voluntary, CAG, CAIS, and FMAP. Playbooks with detailed system information were created to facilitate the application environment migrations. Run books were created for each application to assist in ongoing troubleshooting and management. Audit reviewed the initial application playbook along with the process used to develop the documents ongoing and found the process to be well designed.
- Standard IT Systems Development Life Cycle (SDLC) processes are used for the application migration activities.
- Audit was asked to validate twenty-eight pre-approved controls required to open internet access for two application development environments previously migrated to the cloud. We noted that some processes are still being implemented for an application that provides security and compliance controls. Appropriate processes will be implemented prior to migrating production applications to the cloud or other significant project milestones. As well, additional logging will be added to some servers as an audit trail. Audit provided the validation results to IT management.
- As part of the work that Audit performed, a recommendation was provided to project leadership to consider implementing an improved process for managing the validation of critical tasks and associated controls preceding significant project milestones:
 - Risks should be considered together with environments and applications.
 - Control requirements should be more clearly defined and approved by project leadership.
 - Control requirements should include formally designated owners for each item, including the responsibility for validating that the work is completed prior to any additional compliance efforts being undertaken.
 - Control owners should be responsible for collecting appropriate evidence of controls and depositing it to a central location.
 - A compliance group or person should be assigned to complement the control owners' validations and perform additional verifications of samples or complete sets of work based upon the risk of each item.
 - An individual should be appointed to oversee the validation process and manage it to completion including dates, materials location, and periodic check-ins with control owners.



Advisory Memorandum

- Results should be provided to the stakeholders for final formal approval.

We would like to thank management and staff for their cooperation and professional courtesy in our work performed to date.



Distribution

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