INTRODUCTION

This White Paper provides the need of a software product to enable end-users and to improve the Return On Investment (ROI) on IT Software Assets.

BACKGROUD

With mounting deficit and national debt, the US congress is expecting federal agencies to perform better with fewer resources and improve the utilization of existing IT software assets.

The impetus to improve furthermore comes from GAO, OIG, OMG's recommendations and legislations:

- Clinger–Cohen Act (CCA), 1996
- Government Performance and Results Modernization Act (GPRAMA), 2010
- Federal Information Technology Acquisition Reform Act (FITARA), 2014

CCA and **GPRAMA** focus on **Business Process Reengineering (BPR)** to achieve -

1. Ensure their processes are aligned with "changing needs".
2. Ensure Business Processes accomplish the "agency Mission".
3. Business Processes can change with Environmental, Political, and Regularity changes.

FITARA requires federal agencies to-

1. Increased authority of agency Chief Information Officers (CIO) over IT (Section 101)
2. Maintain inventory of Software Assets (Section 301)
3. Transition to Cloud (Section 303)

CHALLENGES

Updating Processes – The processes need to be continuously aligned with the agency mission objectives and operations which changes with the Government Policies, Environmental Factors, Economical variations, Political mandates, new Acts/memos etc.

As no software product provides dynamic processing, a software process has to be updated by technical developers based on the specification provided by a Business Analysts per End-Users requirements. The update is further delayed by the Technical Architects who translate the specification into technical designs and by the QA team which verify the functionality of updated process. Nevertheless, End-Users are required to perform User Acceptance Testing (UAT) to ensure the process are updated per their requirement. This whole cycle takes months even with agile methodology and by that time additional changes become evident. More often the additional requirement is more prominent than the initial requirement and so processes never are aligned with the present mission objectives. Only way they can be aligned if they can be updated demonically in near real time as illustrated in the figure 1.

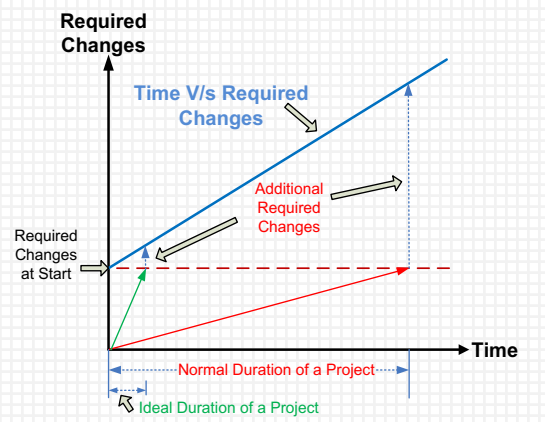


Figure 1: Time V/S Required Changes

We are CMMI/Dev III appraised and do understand the importance of each role (Business Analyst, Tech Architect, QA, Cutover, and Developer) and value that verification and validation can bring. However, since end-users cannot orchestrate their own workflow we have to involve all these roles to support the end-users and consider of implementation of standard procedures and software development methodologies to handle so many roles and their responsibilities. If the software complexity dictates the need of such support why cannot another software handle this support and provide a user friendly solution to end-users?

Authority over IT Assets – Federal Information Technology Acquisition Reform Act (FITARA) 2014 requires Chief Information Officer (CIO) to have authority over software assets. However, it does not provide further detail how CIO should gain this authority in terms of their delegation to user group or access control, governance, cyber security with their cloud deployment etc. In addition, the most of agencies do not have complete up-to-date inventory of their software assets.

FITARA requires the inventory of IT software assets be available to Chief Information Officers and such other Federal officials with the Chief Information Officers Council to reduce the procurement of new software licenses until such time as agency needs exceed the number of existing and unused licenses.

The challenge here is that above cannot be achieved until CIO and the Officer Council have a way to leverage unused/underutilized software assets due to their non-interoperability or platform dependence.

A Council with CIO office is designated the lead interagency forum for improving agency coordination of practices related to the design, development, modernization, use, operation, sharing, performance, and review of Federal Government information resources investment. As the lead interagency forum, the Council shall develop cross-agency portfolio management practices to allow and encourage the development of cross-agency shared services and shared platforms.

The Council guidelines and practices for infrastructure and common information technology applications, including expansion of the Federal Enterprise Architecture process should address broader transparency, required inputs, and generated outputs, underlying functionality and expected outcomes. Here incompatibility of proprietary technologies, non-standards implementations and platform specific dependencies limit the sharing on enterprise wide level and unless these technology barriers are overcome the value of the software assets cannot be realized.

Scalability - Most of the products do not scale horizontally. They provide only vertical-scalability. With vertical scalability more computational power (CPU) and memory is added to the server. Since there is limit on the number of CPU and amount of memory that can be added to a server, vertical scaling does not provide true scaling. With horizontal scaling, the products work in load- balance and fault-tolerance mode by sharing the load with other instances without causing issues related to multithreading. Most of software only provide vertical scalability, which is not a rue scalability.

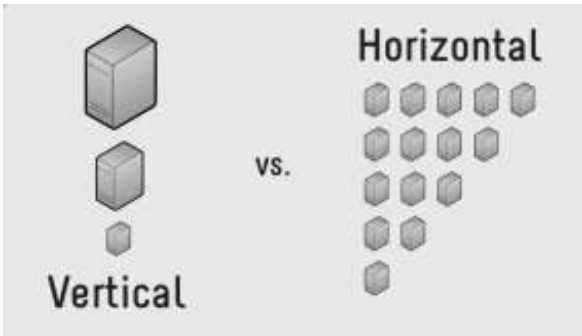


Figure 2: Vertical vs Horizontal

Question here is - it possible to design a software which can enable horizontal scalability of the existing

software assets?

Portability – A software products should be deployable to other servers on need in real-time, as and when the workload increases and free the servers for other products when the workload decreases. This detect the need of a driver who can perform this deployment and unemployment of software in real- time based on the load condition. Elastic cloud cluster manager does provide this functionality but it is limited to software assets that are cloud ready and deployed on cloud.

Transition to Cloud – Cloud First Policy, Zero Growth Data Center Policy and FITARA dictate the speedy transition to the cloud. The transition to cloud from legacy technology and systems is fairly challenging task. Many federal agencies have complex application logic with legacy applications which are still operational and cannot be developed from the scratch for the transition to cloud. In addition to that cloud also increase the vulnerability of cyber-attacks and requires proper cyber security measures and compliances.

Cloud improves the operating efficiency of deployed systems, however it cannot:

1. Leverage Software Assets at granular level.
2. Enable end-users to leverage Software Assets with their workflow.

SOLUTION

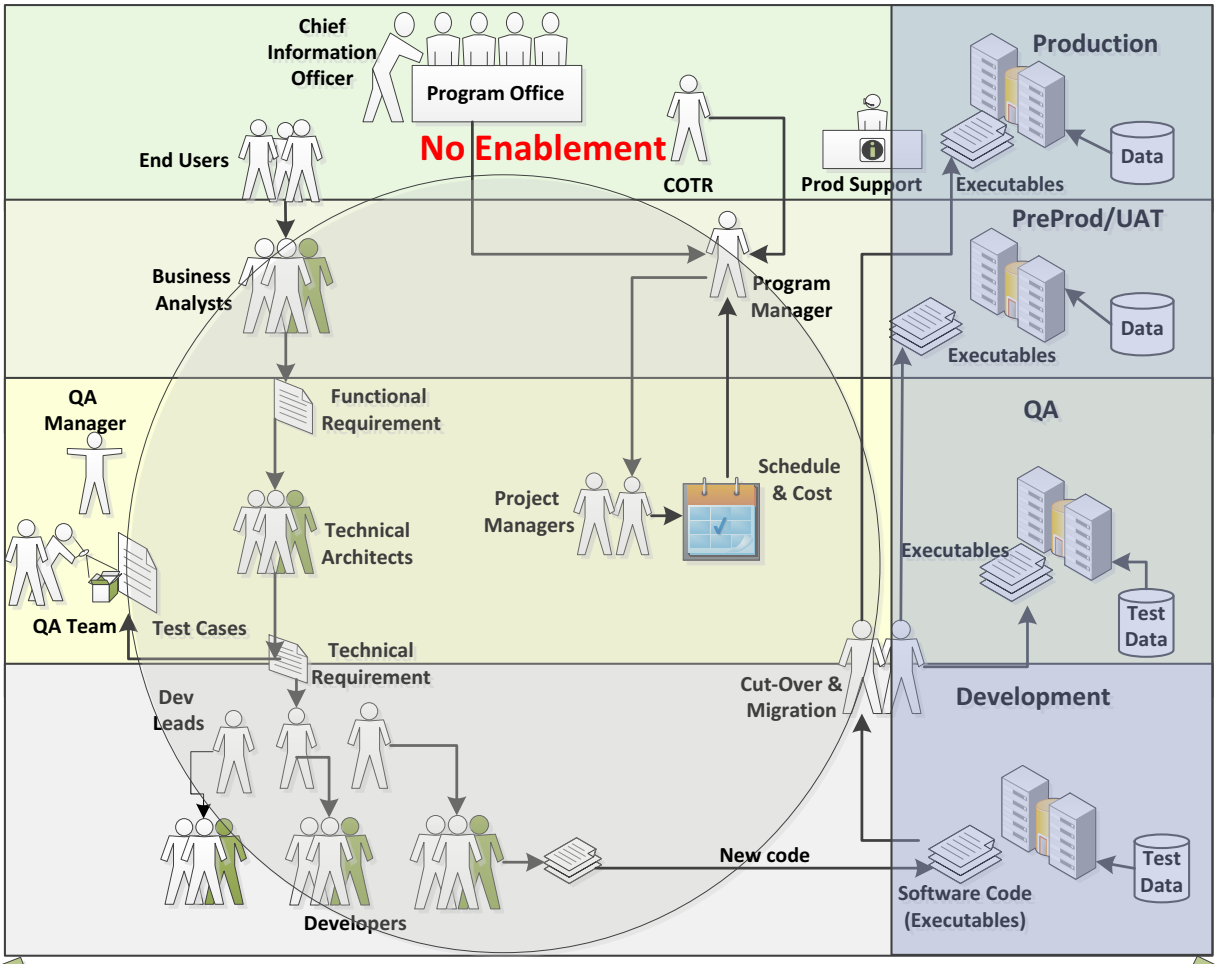
Advent's COTS **Enablement®** provides a solution to all above challenges. It is a framework which generates the processes' code on the fly that end-users design via a web interface just by listing the steps or by the drag and drop.

One-time set-up pulls all the available software assets to a web based dashboard and provides them to end-users based on their role and authority. End-users can see functionality of software assets, inputs they need and outputs they generate and put them to their workflow.

The end-users do not have to worry about the setting up the software assets (their technology, location, connections end points, mapping of input/output parameters etc.). Once the software assets are referenced to their workflow steps, the Enablement completes the coding of the process in the real-time and the process is ready for the execution. The end-users then can execute the process immediately or define a schedule.

End users can check the process outcome via dashboard monitoring that Enablement provides and adjust the process to get the desired outcome, add any dependencies, add user approval steps etc and when they are satisfied with the process, they can follow the procedure for prod deployment. The prod deployment can be done with click of button once it is approved.

Following figure provides an overview on how Advent's COTS Enablement™ improves the operating efficiency by cutting down redundant layers from the landscape.



- Enable Software Assets
- Dynamic workflow
- Enable End-Users
- Time
- ROI

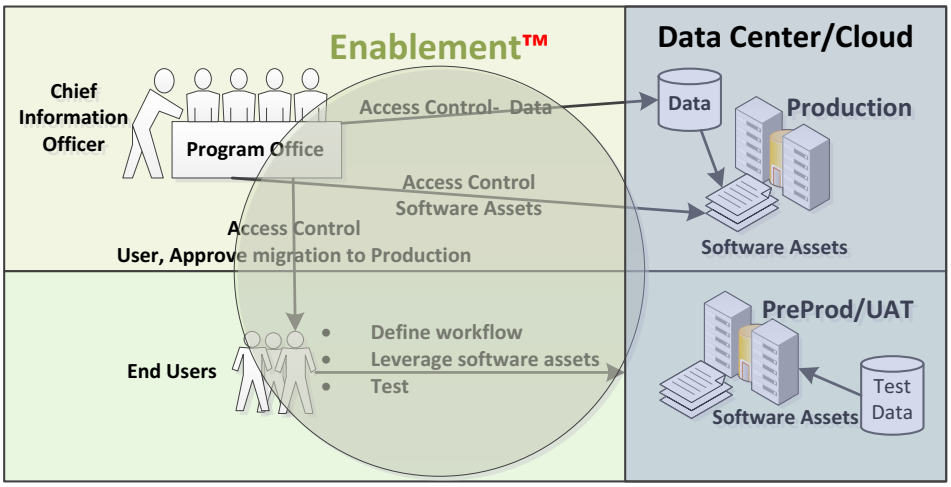


Table 1: Enablement's Benefits Summary

Criteria	Current Software Development	Enablement
Time	Months	Days
Cost	High cost for developing new processes	Low cost (Subscription based)
Personnel Retention	Continue recruit, hire and train the right personnel	Retain the experienced personnel with legacy software systems skills
Security	Compromised Security by sharing the information to BA, Tech Architects, QA, and Developers	Security is not compromised
Sharing Functionality	Cannot share/sell the software functionality to others	New revenue stream
Monitoring	Limited to one system	All systems, end to end
Access control	Highly decentralized	Centralized at Organization level
Utilization control	No control	All systems commutation power, memory, bandwidth
Training	In-depth training for multiple system is required	Basic training of Enablement®
Risk	High with new development	Very low as it uses existing tested software assets

Advent's Enablement® enables end-users to orchestrate new workflow and/or update existing workflows without requiring any software development skills and reduces the total cycle time, redundant layers, miscommunication and provides incomparable cost saving.

Enablement® provides a convenient web based interface which enables end-users to control advance features such as –Controlling threads, Imposing service dependencies, Applying business rules, Scheduling execution time, Configuring SLA reporting, Resolving Data related Exceptions.

With Enablement® end-users can authorize (Approve/Reassign/Reject) and track end-to-end Transactions and Transaction Status at each Stage within a Process.

Enablement® provides inter-cloud portability of services so agency can leverage more than cloud providers seamlessly and get the benefits of increased competition.

Enablement® provides deployment of services on a conventional data center and/or on a cloud along with their Thread control, Service dependencies configuration, Business rule implementation, Orchestration, Schedule control, SLA reporting, Exception alerting & Reporting, User authorization (Approve/Reassign/Reject) support and end-to-end monitoring of transactions for their tracking of their status at each stage within the process.

Enablement® can be instrumental to make an agency compliant with Clinger–Cohen Act, 1996 and its extension Government Performance and Results Modernization Act (GPRAMA), 2010 and Federal Information Technology Acquisition Reform Act (FITARA) 2014.