Summary:

Enterprise IT systems in the public sector are notoriously difficult to modernize due to a confluence of factors such as decades long evolution of current systems, highly customized workflows, regulatory compliance needs, data ownership and usage constraints, privacy concerns, vendor dependence and complex array of benefit programs and policies governing these programs.

Add to that mix, the complex delivery eco-system dependent upon changing relationships between agencies (state and federal), increasing private sector participation, and citizen movement across programs and states; and the picture becomes startlingly complex.

This is in part why risk, cost and timeframes associated with any enterprise system modernization project in the public sector are much higher compared to the private sector. And consequentially, the rate of project failure, when measured against timely address of business objectives, is unacceptably high.

Much has been said and done to mitigate the risk of enterprise IT projects, from acute governance, use of commercial-off-the-shelf software instead of custom-built or transfer solutions, risk sharing with vendors etc. However, the combined result has been limited and sporadic successes.

The fundamental root cause remains; the half-life of business requirements is shorter than the time it takes to implement them. In other words, the enterprise IT systems often become irrelevant by the time their implementation is completed.

So the answer must lie in addressing the fundamental disconnect between speed of change of business requirements and speed of implementation of enterprise IT systems, particularly in the public sector with its unique constraints and complexities.

This need of aligning the business need cadence with implementation cadence is forcing us all to take a new approach: modular implementations. While not a panacea, a modular approach to enterprise IT system modernization represents the most evolved and likely path to success.

What is modularity?

Modular approach can be defined as the lower risk approach to large IT system modernization projects by decomposing the project into smaller, well defined modules that can be independently implemented and independently replaced while ensuring that every module integrates into a larger eco-system of the overall solution.

The governing value proposition is to implement in small functional increments so as to meet business needs in a timely fashion, “fail-fast/fail-cheap” if requirements change or the module does not perform, and integrate all modules in an eco-system defined by a shared data model and shared infrastructure, with an effective user experience.

What is a module?

Before we can aspire to successful adoption and benefits of modularity, we are required to define a module clearly, concisely and consistently.

It is a difficult task because there are as many definitions as there are stakeholders. However, given the context of enterprise IT systems and our need for incremental implementations, lower risk and higher agility, we can think of a module as fully encapsulating functional capability that addresses specific business needs and processes.

Drawing upon a vast experience in software development, system integration and contract administration, we offer the following definition of a module:
A module is a functionally complete, fully encapsulated business logic that is bounded by the following dimensions:

1. User experience
2. Inputs
3. Outputs
4. Externalized data model
5. Integration interfaces
6. Shared services interfaces

**How will modules connect to form an enterprise system?**

A core principle and assumption of a modular enterprise IT system is that while each module is separate, stand-alone and functionally capable; every module must be part of a larger eco-system that results in a solution.

Achieving an enterprise solution that is made up of distinct modules and yet functions holistically requires that eco-system must govern and integrate each module from a functional, user experience, interfaces and data management and shared services perspective.

**Why now?**

Given the momentous changes happening in both commercial and public health and human services sectors, there is a growing and imminent need to modernize a large number of existing IT systems. The cost of failure is going to be very high in terms of economic, social, and human impact and the risk of failure must be minimized.

2016 is likely one of the busiest year on record, in terms of IT system procurements and projects by state and federal agencies. How these systems are procured and implemented will have an impact on several generations to come and therefore it is of utmost importance that a new approach be adopted that will lead to better outcomes for citizens, tax payers and families in terms of cost, timeliness and effectiveness of the next era of IT systems.

Large IT systems are particularly prone to failure when measured in terms of cost, schedule and desired functionality. These failures manifest both in terms of un-met expectations as well as very high cost of ownership once put into production.

A modular approach to enterprise system implementation represents the best hope and strategy for achieving better outcomes for system modernization investments.

**How does it impact procurement, governance, implementation and operations?**

Modularity is going to impact several, if not all, dimensions of enterprise IT systems projects, including procurement, governance and ownership. It fundamentally alters the way the following dimensions of system modernization will be managed:

1. Functional Decomposition
2. Information Sharing
3. Stakeholder Experience
4. Integration Architecture
5. Module replace-ability
6. Procurement process
7. Governance framework
8. Operations and maintenance model

Managing to success
Modularity offers an evolved approach built upon lessons of the past and needs of the future. We have all experienced and often endured the cost and effort involved with custom built or COTS based implementations. Modularity blends the advantages of past successes while giving the business much needed agility.

However, managing modular implementation will require a different and deliberate approach to enterprise IT projects. Modularity management requires us to assess processes and address organizational readiness for each of the above dimensions.

Every one of these processes and underlying assumptions require an assessment and remediation plan to achieve organization readiness and requisite maturity, such that the end goals of modular solutions are truly achieved.

Summary
A modular implementation approach to complex IT systems modernization, represents a new paradigm that offers compelling value in terms of flexibility, agility, rapid innovation and adaptive solutions.

Successful modular implementations require a careful solution decomposition leading to procurement of modules and an integration framework, enforcement of module boundaries and proper encapsulation, governance over an incremental implementation methodology and adjusted approach to maintenance and operations.

The successful outcome will then result in an agile business enterprise and equally agile enterprise IT system. When done right, modular approach remediates many of the risks and costs of enterprise IT systems, particularly in the public sector.

We recommend adoption of a measured approach and use of a modularity maturity model to assess and achieve the required organizational readiness related to solution decomposition, procurement, governance, implementation and operations of a modular solution.

About EngagePoint
EngagePoint has been evangelizing and practicing the discipline of modularity, reusability and integration for years, in our role of a software developer, system integrator and prime contractor.

We firmly believe that incremental, modular, bite-size approach to implementing functionality can work when managed to a disciplined approach to modular integration. We also have learned over the years that successfully integrating modules to achieve a complete enterprise solution requires a heavy emphasis on upfront solution design, functional decomposition, module encapsulation, integration blueprint and data model.

EngagePoint has developed a well defined risk assessment, remediation and measurement framework that can measure the state of readiness and risk factors associated with modular implementations and isolate areas of highest risk and identify action needed to achieve the desired outcome.

In order to properly assess organizational readiness and facilitate the correct behavior across all stakeholders, we have developed the Modularity Maturity Model, based on our own decades of experience in building commercial and public sector solutions for health and human services programs.