An Executive Guide to Information Systems Modernization: Lessons from the Trenches

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The recently published *[Information Systems Transformation: Architecture-Driven Modernization Case Studies](#)*, which I wrote with Philip H. Newcomb, documents real-world software modernization case studies along with supporting chapters about when, why, and how to apply modernization disciplines. For those who have not read the book or whose responsibilities do not involve IT architecture stewardship, I have extracted 15 principles you can use for planning, approving, and funding initiatives involving existing information systems. These principles offer simple guidelines about when and how to apply modernization disciplines. Each of these 15 principles, extracted from chapter 15 of our book, is listed below:

1. Any project that directly or indirectly relies on or contemplates modifying any existing software systems should have knowledge of those systems that is appropriate to that project.
2. Assessment of existing application and data architectures incorporates all systems that are directly impacted by the planned initiative and includes all interfaces to external systems or entities.
3. Depth and breadth of an assessment is directly proportionate to the amount of information required for a subsequent project phase.
4. Initial assessment activities focus on gaining a breadth of knowledge about the IT architecture.
5. Subsequent assessment activities focus on gaining a depth of knowledge about the application and data architecture.
6. Metric derivations of existing application and data architectures are essential to qualitative analysis of those environments and to modernization planning.
7. Functional and semantic redundancy and inconsistency are rectified across application and data architectures as appropriate to satisfy the need for modularity, cohesiveness, and consolidation within a given project or target architecture.
8. Business requirements are driven by the transition plan between the as-is and to-be business architecture.
9. Business architecture must be considered and incorporated into a modernization project as appropriate based on the impacts to the application and data architecture.
10. Modernization projects restricted to technical architectures will yield limited value to the business architecture and the business.
11. Software to be transformed into a model-driven, object-based, or services-oriented architecture must be cleansed of structural diagnostics, functional redundancy, semantic inconsistency, and other design and architectural pathologies.
12. Modernization disciplines are incorporated into planned and ongoing projects as is appropriate to the success of these projects.
13. Modernization projects evolve through a series of stages where each delivered stage provides demonstrable business and/or IT value.
14. Initial modernization project stages achieve early wins for front-line business users through the alignment of business processes, user interfaces, and shadow systems.

15. Later modernization stages achieve value through the alignment of application and data architectures with business capabilities, semantics, and governance structures.

The above principles provide guidance about authorizing, planning, funding, and executing projects that involve current state IT architectures. Unfortunately, these principles are routinely ignored, resulting in wasted IT investments, software that is built but cannot be deployed, or, in a worst-case scenario, business disruption. For example, not assessing current state IT architectures often results in cost overruns, canceled projects, or projects that IT believes to be a success but the business community considers of little value or a net negative.

One issue these principles highlight involves scope. The principles suggest that early stage assessments start at a high level and incrementally drill down into more detail, narrowing the breadth and increasing the depth of each subsequent stage of analysis. When you visit a doctor's office, the doctor asks basic questions to assess your overall health. Subsequent diagnosis may result in more invasive testing and culminate in exploratory surgery. Step one is not surgery. In modernization terms, the first step should rarely, if ever, be business rule extraction, which is akin to invasive surgery. Rather, the first step establishes a big-picture perspective and increases the depth of understanding through subsequent analysis. The doctor may remove a problem during exploratory surgery. In modernization, this means that in-depth analysis is coupled with incremental IT architecture transformation.

Another principle addresses functional redundancy, inconsistency, and fragmentation across business and IT architectures. These issues are commonly found to be the root cause of priority business issues, such as managing customers across lines of business. Yet IT routinely sidesteps these issues, typically adding *more* redundancy and fragmentation to IT architectures on a given project. When this occurs, IT architecture grows increasingly misaligned with business architecture. As modernization tools become more powerful, with the ability to derive models from existing IT architectures, this principle will ultimately dictate whether a project is a net positive or net negative to the business.

The biggest issue that causes IT projects to go awry is when major initiatives are not business-driven and do not align with business architecture transformation requirements. When business architecture is taken into consideration, as stated in principles 8 and 9, modernization becomes a powerful means of transforming the enterprise. And when business value is the top priority, as stated in principles 14 and 15, then funding for modernization initiatives will become that much more common.

Organizations violate these principles regularly and continue to pay the price. I can name numerous organizations that have violated various modernization principles, wasting millions or tens of millions of dollars as a result. Continuing to ignore these principles will result in IT spending that fails to deliver value to the business, customers, constituents, and stockholders. On the other hand, executives, planning teams, and even business professionals can use these simple principles as a checkpoint on IT project charters, funding, and planning efforts.