COTS INTEGRATION AND SYSTEMS ARCHITECTING
A Systems Architecting Perspective on COTS

by

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Fundamental principles of systems architecting violated by a COTS mandate

1. The reason for building systems is to achieve a unique system function. A COTS mandate would preempt "form follows function."

3. The architect cannot know everything but must know what affects the system as a whole. Denied access, for whatever reason, is a serious risk.
   Examples: Space system lubricants. Hidden software routines. Unspecified interfaces.

3. The architect’s task is to reduce uncertainty. COTS increases it.
Some applicable "warning" heuristics for the COTS mandate

** Success is defined by the beholder. Is COTS use a "success?" Where does it stand relative to public safety, information security and access, etc.?

* In architecting a new (software) program all the serious mistakes are made in the first day.

* The most dangerous assumptions are the unstated ones.

* Don’t assume that the original statement of the problem is necessarily the best, or even the right one.

* The realities at the end of the conceptual phase are not the models or presumptions but the acceptance criteria.
Some applicable "prescriptive heuristics" for COTS use

* Any extreme requirement must be intrinsic to the system's design philosophy and must validate its selection.
  Example: Keep COTS use and reuse in general to systems with the same system philosophy (reliability, environment, acceptance criteria); i.e., within the same product family

* Build in and maintain options as long as possible.
  That is: Don't dig a COTS hole you can't get out of later.
  Example: Loss of supportability (Microsoft Works 2.0, earlier microprocessors)
  Example: Modification or useage nullifies warranty and support
  Example: Use is outside product regime ((Shuttle "O" rings)
  Example: Supplier goes out of business or disappears in a "restructuring."
  Example: Foreign policy limits on materials, on purchase or on use

* An element good enough in a small system is unlikely to be good enough in a large one. Example: Reliability and safety per unit must increase as more units are added and the same overall system performance (say, 1% failure rate) is demanded.