



Process Replication and Model-Based Process Improvement



You may be asking, “What exactly is process replication?” It is the ability to take an effective, well-defined process framework from one environment and apply it to another that provides similar products and services. Process replication enables engineers and their teams to hit the ground running.

Processes are what we develop, document, and then use to train people to do good work in a repeatable way. From this, we expect those we’ve trained to be enabled to produce high quality products on cost and on schedule. To maximize success, these processes are based upon best practices found in capability maturity models. The processes are the “how” and the models are the “what.” An important thing to remember is that they are complementary.

At NAVAIR, the Team Software Process (TSP) has been an extremely effective way of carrying out process replication. It is a complete, ready-to-go process with training for multiple levels of a project and its organization, process scripts for project planning and operations, planned coaching to help teams maintain direction, and a choice of tools that automate its use. All of this creates a team environment that both supports disciplined individual work and builds and maintains a self-directed team. The TSP has continually proven its ability to replicate self-directed teams that address critical business areas, including cost and schedule management, effective quality management, and cycle-time reduction.

Furthermore, the fundamental principles of this team process can be replicated with many other engineering and technical teams to plan and operate their work of delivering products and providing services: for instance, in requirements elicitation and definition, design, implementation, test, maintenance—and even in process improvement itself.

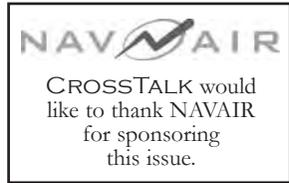
The team process builds on and enables the replication of personal process. These personal processes show individuals how to measure their work and use that data to improve their performance. This, in turn, guides individual feedback to the team process, accelerating teamwork and creating an environment where individuals come together as a self-directed team that can use data to both know where they stand and more effectively plan for the future.

Experiences in organizations both within NAVAIR and beyond have shown that success in organizations pursuing model-based process improvement were accelerated when done in conjunction with their projects using these replicated processes.

Four articles in this issue address various experiences in the area of processes ready for replication. In *Lean Enablers for Systems Engineering (SE)*, Dr. Bohdan W. Oppenheim presents a collection of “dos” and “don’ts” of SE with ready-to-go wisdom on how to prepare for, plan, execute, and practice SE and related enterprise management using Lean thinking. In *A Framework for Systems Engineering Development of Complex Systems*, Dr. Karl L. Brunson, Dr. Jeffrey Beach, Dr. Thomas A. Mazzuchi, and Dr. Shahram Sarkani present an SE process—called the Incremental Commitment Model—where schedule tasks are evaluated against technical and manufacturing risk drivers. In *Why Software Requirements Traceability Remains a Challenge*, Andrew Kannenberg and Dr. Hossein Saiedian provide a brief introduction to software requirements traceability and investigate why many challenges exist in traceability practices today. Dr. Christof Ebert’s article, *Software Project and Process Measurement*, briefly introduces us to software measurement and provides practical guidance for project and process measurement.

Two supporting articles will also help organizations with process improvement and SE: Larry Pizette, Salim Semy, Geoffrey Raines, and Steve Foote’s *A Perspective on Emerging Industry SOA Best Practices* will help organizations improve business processes while David P. Quinn sees *Resistance as a Learning Opportunity* for process improvement in software and systems engineering.

I invite you to consider these experiences and approaches as additional ways to make process improvement happen for you and in your organization. Best practice models and process replication together do make our engineering products better, faster, and cheaper.



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