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SECTION 3

DFTS and the PICS Framework

A case study of GE's Operating System is introduced as a vehicle to launch a new initiative and enrich it through several yearly cycles. Effective management of the software development process is emphasized using sound project management principles. This is followed by a discussion of the two steps that comprise the "secure" phase of the PICS model: *freezing the improvements and gains* and *integrating the initiative*. Next is Case Study 2, "Quality Initiatives and Their Integration at TCS." A brief discussion of *application in small software firms and e-cottages* is provided. The article ends with a brief discussion of the future course of a DFTS initiative.

DFTS and the PICS Framework

This short cut discusses how to launch the DFTS process effectively.¹ It particularly emphasizes building organization-wide competencies to launch and sustain DFTS. The PICS implementation framework consists of four phases: *plan*, *implement*, *control*, and *secure* (Figure 1). The following sections look at each of these in turn.

¹ Many of the ideas in this article are associated with topics covered in *Design for Trustworthy Software* by Jayaswal and Patton, published by Prentice Hall.

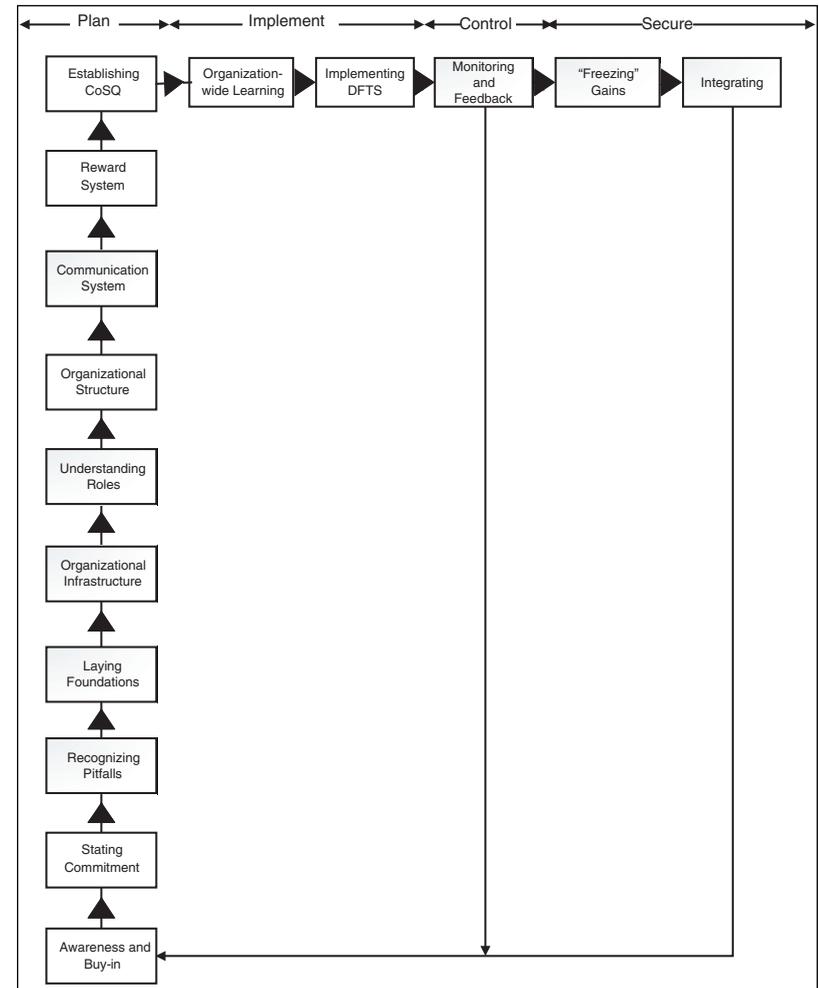


FIGURE 1 PICS Implementation Framework

SECTION 4

Plan

Plan

The first ten steps of DFTS represent various planning activities. They constitute both the “software” of the implementation process, such as creating awareness and securing commitment, and its “hardware,” such as designing a supportive organizational structure and communication and reward systems. These collectively constitute an organization’s infrastructure and management practices. Table 1 describes the planning process and its deliverables.

TABLE 1 DFTS Planning Activities and Their Deliverables

Step Number	Step Name	Deliverables
1	Creating management awareness and buy-in	Understanding the DFTS process Management buy-in DFTS Steering Committee Appraisal of existing quality capabilities Outline plan and budget
2	Communicating top management’s commitment	Communication strategy and plan
3	Recognizing pitfalls	Understanding potential pitfalls Identifying implementation strategies and support systems

TABLE 1 Continued

Step Number	Step Name	Deliverables
4	Laying philosophical foundations for a quality-focused enterprise	Awareness of current shortcomings Understanding the need to change Strengthening the quality culture
5	Building the organizational infrastructure	Understanding current shortcomings Identifying remedial measures
6	Understanding the roles and responsibilities of the key players	Creating a quality-supportive environment Understanding roles and expectations
7	Designing a supportive organizational structure	Creating a customer-, process-, and network-based structure
8	Establishing an effective communication system	Plan for robust internal and external communication
9	Creating an appropriate reward system	DFTS-supportive reward system
10	Establishing a CoSQ reporting system	Providing visibility of cost and causes of poor quality Identifying opportunities for improvement Providing a common language for communicating the consequences of poor quality

SECTION 5

Implement

The ten planning activities are critical elements of the DFTS deployment process.² They reinforce the initial launching of the initiative, help integrate it into the organization, and build foundations for continuous improvement. Strong management systems and practices are crucial to a successful implementation. GE and Toyota have a history of excellent management systems and practices that have helped them immensely in their various quality initiatives (see Case Studies 20.1 and 20.2 in Chapter 20 in *Design for Trustworthy Software*). GE's sound management systems, such as Work-Out™, Operating System™, and Change Acceleration Program (CAP™), as well as its performance culture based on *speed, simplicity, self-confidence*, and *worker empowerment*, have been instrumental in its enormously successful Six Sigma initiatives. Organizations should learn and adapt best practices rather than trying to copy them. We cannot overemphasize the need for the CEO and top management to work together to strengthen the organization's quality culture, infrastructure, and management practices before implementing the DFTS initiative.

² For more about the DFTS deployment process, refer to Chapter 5, "Organizational Infrastructure and Leadership for DFTS," in *Design for Trustworthy Software* by Jayaswal and Patton, published by Prentice Hall.

Implement

DFTS implementation consists of steps 11 and 12 in the PICS framework (see Figure 1). It involves two broad sets of activities: launching organization-wide learning and implementing the DFTS process. These constitute this article's main focus. They involve designing and delivering formal DFTS learning and training for the organization as a whole.

Step 11: Launching Organization-Wide Learning

Organization-wide learning helps build capabilities to inspire and sustain the DFTS initiative as well as build foundations for continuous learning and improvement. To attain those goals, the organization has to transform itself into a learning entity that can continually identify opportunities for improvement and innovation. Such capabilities can be powerful instruments in making quality initiatives self-sustaining and for launching future initiatives. It takes years of committed leadership to build corporate cultures in which continuous improvement and innovation thrive (see Case Studies 20.1 and 20.2 in Chapter 20 in *Design for Trustworthy Software*). It is important to identify both long- and short-term objectives and to ensure that they are