



Manager



Tom Roberts

Why Can't We Implement This SDM?

To cope with the mounting demands for large, complex information-system applications, most organizations turn to a systems development methodology. SDMs are logically appealing, offering a flexible framework for the sequence of tasks needed to develop an application, as well as tools and techniques for accomplishing these tasks.

By creating an engineering-like development discipline, SDMs provide explicit deliverables and consistency as information systems are built. In its intent, an SDM should reduce the risk associated with shortcuts and mistakes and ensure that quality infuses the software process. On the surface, at least, it would seem that every organization should have an SDM in place.

Unfortunately, most IS organizations fail to successfully implement and utilize an SDM. The question is, why?

WHO ARE SDM IMPLEMENTATION STAKEHOLDERS?

SDM stakeholders are people with a vested interest in a successfully implemented methodology. They include functional and IS managers, systems personnel, external consultants, and end users. Each stakeholder views SDMs from a different perspective. To successfully adopt an SDM, all stakeholders must be convinced that the SDM

- ◆ has a relative advantage over the existing norms offered by no methodology;
- ◆ is compatible with the organization and its structure, culture, and skills sets; and
- ◆ is not overly complex (thereby generating more costs than benefits).

Because stakeholders are often unaware of an SDM's benefits and pitfalls, training at all levels is necessary. Without training, any attempt to change work and management styles, job descriptions, procedures, roles, and responsibilities—all required

when implementing an SDM—is doomed to failure. In all cases, people must change the way they do their work. But changing the existing norms and work habits that have been institutionalized through repetition and a shared common interpretation is extremely difficult.

WHAT FACTORS ARE IMPORTANT TO IMPLEMENTING AN SDM?

In a survey of potential SDM adopters that my colleagues and I conducted ("Factors That Influence System Development Methodology, *IEEE Trans. Software Eng.*, Vol. 24, No. 8, Aug. 1998, pp. 640–649), we asked what factors they perceived as important to implementing an SDM. The following summarizes the results:

◆ *Understanding methodology specifics and benefits.* Stakeholders needed information to understand the new SDM life cycle, activities, techniques, application of techniques, and supporting tools and their benefits. To reduce resistance to change, SDM expertise can help company management sell the need for the SDM to system and functional personnel.

◆ *System personnel manager involvement with and responsibility for organizational SDM transition.* Clearly, the transition from the old SDM to the new one represents cultural change. Stakeholders must understand what is new, what is different, and how these innovations and differences will lead to direct personal and organizational benefit.

◆ *Functional manager involvement and support.* Functional managers should be involved in an SDM implementation's initial planning and provide resources for completing the SDM implementation project. Success demands their commitment to the new SDM's implementation and use. These stakeholders should also develop ways to measure the implementation's progress.

◆ *External support.* Because the personnel in

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most companies typically do not have the knowledge or experience to implement an SDM, external consultants can provide significant assistance. External support is typically needed in planning and completing the SDM implementation, developing training courses and materials, training personnel on various aspects of the new SDM, and assessing the implementation's success.

◆ *Use of models.* Most SDMs use modeling methods. An important part of using an SDM is knowing how and when to use modeling methods, how different models relate to each other, and how end users participate in creating the models and keeping the models integrated.

That our early adopters identified these success factors for a new SDM's implementation is really not a surprise. Unfortunately, when probed for specifics, the survey's participants indicated that their SDM implementation efforts fell short with regard to all of these factors. Stakeholders revealed a wide gap in what they believed should occur and what was happening in practice. The real question becomes, "If you know what you need to do to implement an SDM, why are you not doing it?"

WHY ARE IMPLEMENTATIONS SO DIFFICULT TO ACCOMPLISH?

As I've said, SDMs represent cultural change—and cultural change is difficult. Historically, organizations combat resistance to change with education about the new SDM's benefits and capabilities. My survey found, however, that stakeholders already understood the importance of implementing a new SDM and its benefits. Still, the implementation process was not going as they expected. There was a huge gap in what they believed they should be doing and what they were doing to implement the new SDM. With this gap in mind, I'll suggest a few causes.

Technological dynamics

Hardware, communication, and software capabilities, as well as software development tool resources, are changing so fast that organizations do not know which process to adopt. Implementing an SDM usually takes at least two years—an eternity in today's technological time frame. Most stakeholders won't commit to a process that might be obsolete before implementation is complete.

Companies suffer from something akin to attention

deficit disorder when implementing SDMs. As technologies change, companies jump to the next SDM before completely and successfully implementing the original. Because systems stakeholders know about new technologies and processes, they hesitate to fully commit to the SDM, preferring rather to look over the horizon to what's coming next month or next year.

Backlog

Given the two years to implement a typical SDM, the organization wants to help itself in the long run with process-improvement projects such as SDM implementation, but is too busy meeting short-term requirements to tend to these types of projects. Organizational defense mechanisms add to this strained situation, making it extremely difficult for organizations to do what they know is best for their long-term survival and success. Short-term project demands dictate a different path.

Espoused theory

According to propositions derived from the theory, individuals have and use two theories of action: the ones they espouse and those they actually use. Espoused theories are the values, beliefs, and attitudes individuals express and give allegiance to when questioned. However, the one that actually governs their actions is the theory-in-use, which might or might not be compatible with their espoused theory. So, stakeholders are really "talking a good game" with regard to implementing an SDM. While everyone says they want to implement the new SDM, the commitment to the new process is missing. Stakeholders espouse the politically correct answers, but follow up with little or no action to implement the SDM.

Freedom of movement

When implementing an SDM, the fear is not the change itself, but the addition of controls to the development process. An SDM imposes checkpoints and controls visible throughout the development effort, which ensure that commitments are met. Developers often complain that methodologies are confining, stifle creative thought, and do not fit the way systems are actually developed. These sentiments—conveyed to the other constituents with comments about how their positions would be diminished through the SDM—could be informally communicated and undermine the implementa-

Continued on page 75



Manager

*Continued
from
page 71*

tion. Not wanting the methodology to be implemented, stakeholders could quietly make it impossible to implement the additional control.

WHAT SHOULD AN ORGANIZATION DO?

SDM implementation should be treated like any important project conducted within the organization. The SDM implementation's scope should be identified—that is, the vision of the total solution that integrates methodology, tools, and techniques. The project tasks, deliverables, and schedule should be defined. Measurement methods that adequately track the project's progress and the development of acceptable, approved deliverables of the SDM implementation project should be established. Finally, the stakeholders must define how the new methodology will affect roles and responsibilities for personnel involved. This task is paramount, because the new SDM will affect all major stakeholders in the organization.

Commitment and involvement within the planning cycle must be carried through to the project's

execution and control. Participation of all stakeholders will increase overall acceptance by enabling development of realistic expectations about the methodology, providing an environment for constructive negotiation on issues, creating a spirit of ownership, decreasing resistance to change, and building commitment. Additionally, participation should increase the quality of the methodology being implemented by improving the understanding of the methodology, providing more complete and accurate requirements, avoiding development of unacceptable processes, and providing necessary expertise about the organization and work processes that the methodology will support.

Successfully implementing an SDM requires planning, project management, education and training, and participation. If these are done properly, the organization will achieve the SDM success factors. ❖

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