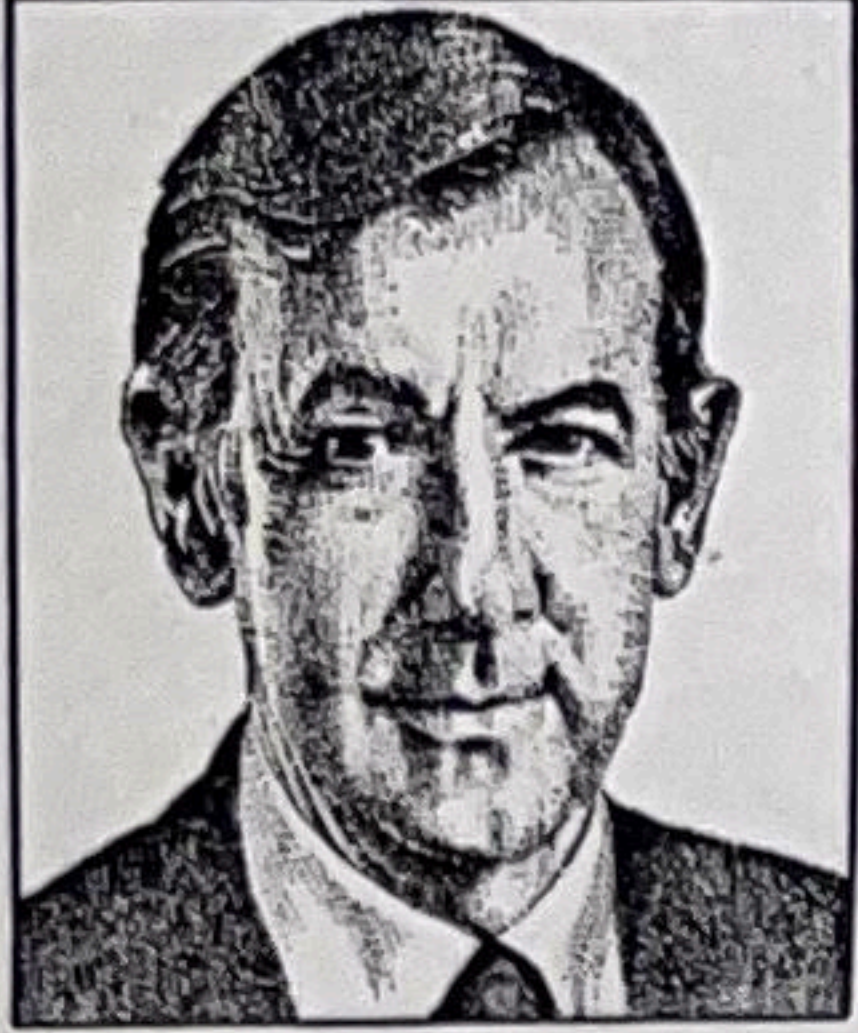


## APPLIED INTELLIGENCE

## SWAT Teams Will Play Pivotal Role in '90s Development



**JAMES  
MARTIN**

*Small, highly trained teams of IS personnel, sometimes called SWAT teams, are being used more frequently to develop applications much faster than with traditional techniques.*

Information-systems (IS) organizations in the 1990s will

have to work more quickly, with fewer development personnel, to meet the demand for new applications and enhancements to existing applications. A pivotal technique for building applications faster with fewer personnel is the use of small teams of highly trained developers. These teams are sometimes called SWAT teams, with SWAT standing for specialists with advanced tools.

SWAT teams typically consist of three or four highly motivated IS development personnel armed with the most powerful, integrated tool sets available and thoroughly trained in high-speed development techniques. The use of powerful tool sets can allow a small team of skilled developers to create a substantial system in two or three months.

New development methods, such as rapid applications development (RAD) and Du Pont's Timebox, are based on the use of small development teams. As described in previous articles in this series, the RAD life cycle has four phases: requirements planning, user design, construction and cutover.

#### A Skilled Facilitator

Requirements planning is performed in a workshop session with well-structured procedures under the guidance of a skilled facilitator. High-level, knowledgeable end users determine the functions to be performed by the system in combination with IS professionals.

The application is specified in more detail during the user-design phase, which typically consists of two joint applications design (JAD) workshops. In the JAD sessions, users define the requirements of the system under the guidance of a JAD leader. IS personnel in the JAD sessions capture the specifications using an integrated computer-aided software engineering (I-CASE) tool set. The tool set is used to coordinate the design with existing information in the I-CASE repository and to build running prototypes of the application.

At the conclusion of the user-design phase, the detailed functional specifications, in the form of a running prototype, are handed over to the SWAT team for implementation. During the construction phase, the SWAT team uses the I-CASE tool set to expand the prototype, stage by stage, into a production system, as shown in the figure.

The I-CASE tool set automatically generates the code for the application, as well as coded database descriptions and system documentation. Generally, the

SWAT team works within a fixed interval of time, known as the Timebox.

The goal of SWAT team management is to group together high performers and train them intensively in the use of the most powerful tools. A SWAT team skilled with a powerful I-CASE tool set should be able to generate, on average, 600 lines of COBOL, or the equivalent, per person-day.

In 60 working days, three people can generate 108,000 lines of COBOL. (In many cases, a skilled SWAT team achieves substantially more than this.) Most data-processing applications contain fewer than 100,000 lines of COBOL, or the equivalent. These may be tackled

Building the most effective SWAT teams is an art that requires careful observation of human personalities and interaction. The goal is to combine the most capable people with the most powerful tool set, but those people must enjoy working together so that the team is greater than the sum of its parts.

Each team member must be able to work fast and constructively, working well with the other team members. He or she should be able to work long hours when necessary. The team member must be fully familiar with the techniques that are used, and must be as skilled as possible with the tool set and be able to operate fast with it.

member, such as database modeling, physical database design and end-user interfacing techniques.

A member of a RAD SWAT team uses a different mix of skills from the traditional systems analyst or programmer. These skills include analysis; design; code generation; testing; skill with the I-CASE tool; good interaction with the end users; the ability to translate end-user statements into working prototypes; and effective interaction with other team members.

Whereas the joint requirements planning and user-design teams stay together for a week or two, the SWAT team should stay together for years if it works well. Team members may occasionally leave and be replaced, but the team retains its skill, reputation and character. Much more time can be taken in selecting the team members and making sure they really gel into the most effective team.

A team must be free to do its own thing. Its effectiveness will be lowered if an outside authority tells it how to work.

SWAT teams will sometimes make mistakes and learn from those mistakes. But the power of the team will be sapped if it is not free to do what its members think will work fast.

#### A Fortified Island

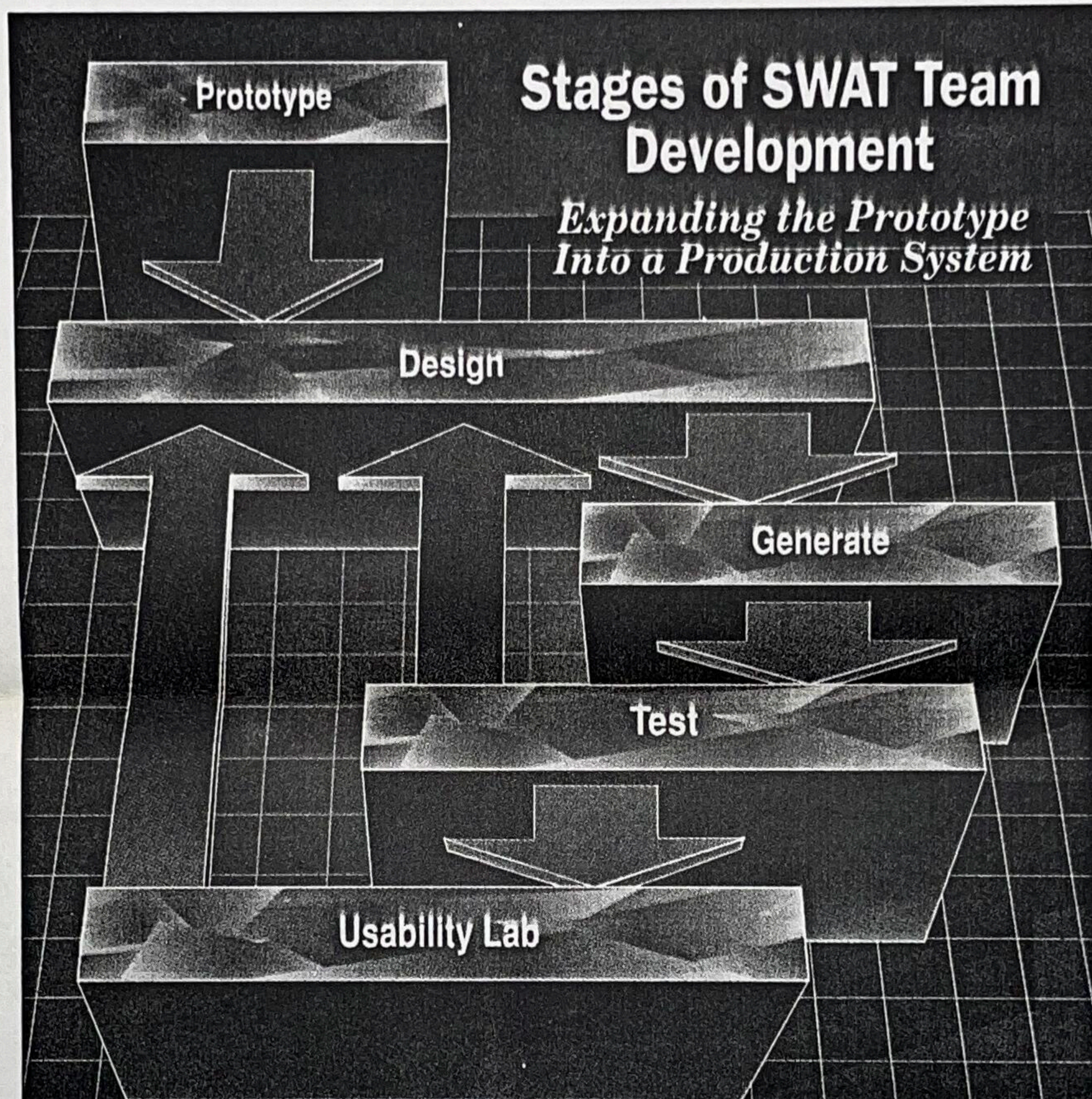
A SWAT team is sometimes irritating to other developers or managers. The team can be exclusive and self-sufficient. But if it regularly achieves 200 function points per person-month, it is one of the most valuable resources of an IS executive. However self-sufficient and aware of its own uniqueness the team becomes, its members must listen carefully to what users need. The user interaction is an integral part of being effective in the RAD life cycle.

A SWAT team must have a realistic target for project completion. If the target is hopelessly tight, the team becomes tense and demoralized. Unachievable goals sap the developers' energy.

If management is pressing, regardless, for an unobtainable deadline, the team becomes cynical and loses much of its motivation.

SWAT teams that master modern tools achieve results that are very impressive compared with traditional programming, but if they are put into a no-win situation, their pride is wounded. At best, their productivity drops; at worst, the team may break up.

Next week I will discuss how applications can be built within a Timebox—a rigidly defined period of time in which the development deadline is immovable, but the functionality may vary. ■



John Avakian

**SWAT teams typically consist of three or four highly motivated personnel trained in high-speed development and armed with the most powerful integrated tool sets available.**

by one SWAT team.

Projects of more than 1,000 or 2,000 function points might be split into subsystems that can be tackled by separate SWAT teams. (The exact number will depend upon experience with the chosen tool set. Some SWAT teams achieve more than 2,000 function points in 60 workdays.)

A SWAT team can perform intensely for a 60-workday period. It cannot keep up such intense work indefinitely. Periodically the team members need time off to relax and regroup. Confining the effort to 60-workday periods can help avoid the problem of burn-out.

Although many SWAT teams are assembled quickly, it takes time to build the most effective team. The members' personalities and skills must complement one another. Their work habits must be compatible, and their attitudes must be positive.

In combination, the team should contain all the skills needed to build the application. Each team member should be capable of analysis, design, action diagramming, code generation and transaction testing. Each should have experience with the operating environment of the target system. Some more specialized skills may reside with one team

*The concepts embodied in RAD are described in a new volume in the James Martin Report Series. For more information on this volume, call (800) 242-1240. For information on seminars, contact (in the United States and Canada) Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402 (213) 394-8305. In Europe, contact Savant, 2 New St., Carnforth, Lancs., LA5 9BX United Kingdom (0524) 734 505.*