Affinity IT
GLOBAL IT TRAINING

IT Training Solutions
Productivity By Design

Maximizing Training Impact

Using Integrated Case Studies

By:
Joseph W. Fisher, President
Affinity IT, LLC

Maximizing Training Impact

Using Integrated Case Studies

Introduction

There was a time when a typical software development team consisted of various Subject Matter Experts with diverse areas of expertise such as a Database Management, Graphical User Interface Design, Window Systems, Programming Languages, and Development Tools. This phenomenon was often the result of the inability to find practitioners sufficiently versed in the wide range of target technologies needed by the organization.

As a result of standardization within the industry, the proliferation of open systems solutions, and the passage of time, the field of Software Development has matured to the point where organizations are now often able to employ general practitioners rather than Subject Matter Experts on their software development teams. It is no longer an unrealistic goal to seek staff that can participate in the design and implementation of any portion of the application. In consequence, the knowledge and productivity expectations for developers are high and broad ranging.

Of course, not all staff will be found to have the requisite experience or expertise to meet these expectations. Both new and experienced staff will exhibit skill gaps that need to be bridged to prepare them for their assigned tasks.

Extended Training Programs

Organizations often choose to bridge the skill gap through training courses. If the needs are significant, an *Extended Training Program* is often considered. An Extended Training Program is a dedicated period of intense training in targeted technologies to bridge skill gaps identified in key development staff. ETPs are typically longer than two weeks and span multiple technologies.

Organizations implementing Extended Training Programs seeking to re-skill existing staff or level-set new staff often approach the problem with an a-la-carte collection of Training Courses based on a statement of technical need by managers. The weakness of such an approach lies in the fact that while each course may incorporate hands-on lab exercises to encourage skill mastery, it ignores the crucial skills of technology integration -- The real key to developer productivity.

Integrated Case Studies

The remainder of this document discusses *Integrated Case Studies* (ICSs), dedicated Lab Exercises designed specifically to force students to grapple with the challenge of integrating diverse technologies. We will also examine the challenges of ETP design and delivery, discuss options for ICS design and delivery, and relate some real-world experiences.

Extended Training Programs

An Extended Training Program is a dedicated period of intense training in targeted technologies to bridge skill gaps identified in key development staff. ETPs are typically longer than two weeks and span multiple technologies. They are usually composed of a set of technologies that will be (or already have been) integrated together in a software system. The objective of an ETP is to prepare the participants to be productive with the target technologies.

Extended Training Program Design

The "design" of an ETP entails analyzing and determining the answers to the following questions:

- Which technologies should be included ?
- What topics within those technologies should be included ?
- How long should the program be ?
- Who should attend ?

The design phase can be carried out in a number of different ways, all of which fall within the general roadmap shown in Figure 1. Because a properly designed ETP will closely reflect the specific needs of the sponsoring organization, they typically are limited to participants of that organization.

The "General Roadmap for Conducting Extended Training Programs" highlights some of the challenges facing Training Managers, including the selection of *Target Technologies*. Target Technologies are those technologies deemed strategic to the organization and valuable enough to train development staff. Skill Gap Analysis is performed to determine the Technologies and topics to be included within the Training Program.

Each course within the ETP will typically incorporate hands-on Laboratory Exercises to clarify and reinforce the concepts presented during that topic. This is essential for good results and reflects the Instruction Design maxim: Tell Them, Show Them, Let Them Do It.

Lack of focus on integration

One weakness often exhibited by ETPs is the highly focused nature of the Lab Exercises. Those included within each course are focused exclusively on the topic under discussion, and not on the integration of the Target Technologies. Failure to address this need results in "islands of understanding": mastery of each isolated topic while still lacking the capability to integrate the Target Technologies together. Since most modern Solution Systems consist of more that one technology, this represents a serious gap.

Integrated Case Studies

An *Integrated Case Study* (ICS) is a Lab Exercise designed specifically to challenge the student with the integration of Target Technologies. It is typically a multi-day assignment that entails the design, implementation, and testing of a system that incorporates most or all of the Target Technologies.

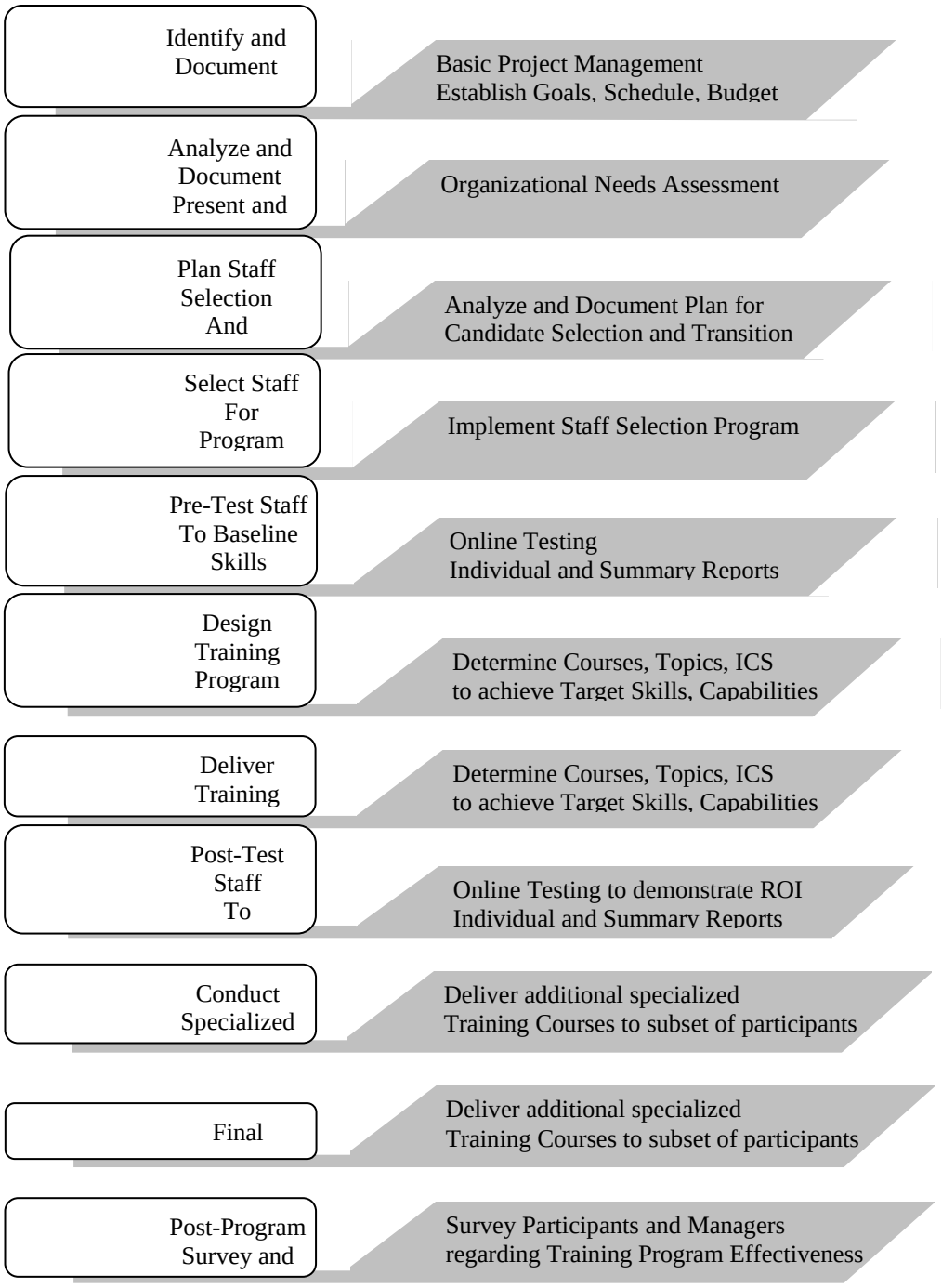
Ideally, an ICS should encompass all Target Technology topics covered by the ETP and be relevant to the Sponsoring Organization's industry and problem domain.

Benefits

The benefits of adding an ICS to a Technical Training Program are significant and include:

- The reinforcement of Target Technologies and relevant Topics, leading to a more effective Training Program.
- Participants being better prepared to apply Target Technologies to real world problems.
- A better Return On Investment (ROI) for the Training Program
- The analysis work required to design an ICS provides valuable insight into the design of the ETP itself
- Students find the Training Experience more satisfying and rewarding as a result of "having accomplished something" non-trivial.

Figure 1: General Process For Conducting Extended Training Programs



The incorporation of an ICS provides other opportunities not typically found in Training Programs. Training Program designers may choose to utilize the ICS to:

Other Benefits

- **Engender a Team-Oriented environment** by requiring students to complete the ICS in Teams. This may or may not include the additional challenge of working within diverse teams.
- **Develop / Improve Requirements Gathering skills** by incorporating Systems Analysis into the ICS
- **Experience the Integration Challenges** involved bringing together components authored by different team members
- **Develop / Improve Presentation Skills** by requiring a presentation of results at the conclusion of the ICS
- **Showcase Accomplishments** by participants in a special presentation to peers, managers, and executives.

While the potential benefits of an ICS are significant, the fact is that they are not commonly found in Training Programs because of the some of the Challenges they pose for the Sponsoring Organization as well as the Training Provider.

The challenges facing the Sponsoring Organization when considering whether to incorporate an ICS are non-trivial:

Challenges for the Program Sponsors

- An ICS will extend the program duration anywhere from 1 day to as much as two weeks
- An ICS will increase the cost of the Training Program because it must be custom designed and delivered.
- Having fought long and hard to sell the ETP internally, the prospect of extending it is often politically and/or financially difficult
- Not all Training organizations or vendors have the ability to design and/or deliver an ICS effectively

The challenges for the Training Provider are also formidable:

Challenges for the Training Provider

- Analysis is required to determine a “suitable problem” that is relevant to the Sponsoring Organization, large enough to be challenging, yet small enough to be accomplished by program participants
- The problem must be documented in a way that is engaging, challenging, reinforces desired skills, yet can be followed independently
- The ICS must be delivered by a competent Instructor/Mentor, well versed in the Target Technologies and the specifics of the ICS. Such resources can be hard to locate.

Overcoming ICS Challenges

Although there are sometimes hard constraints on budget and schedule that simply cannot be overcome, the potential benefits of an ICS are significant enough to warrant consideration of the following when designing an Extended Training Program:

- Carefully analyze the content of each Course. Courses are typically designed for general audiences and may contain topics that may be valuable to some organizations but superfluous to others. You might be able to shorten one or more courses, and thereby find some ICS time.

Pay Now Or Pay Later

- Make the “Pay Now or Pay Later” argument internally within the Sponsoring Organization. Developers will need time to learn how to integrate the Target Technologies; it is unavoidable. Do you want them learning while the “Schedule Clock” is ticking ? Or would it be better to allocate time within the Training Program for this purpose ?

- Measure the ROI of your Training Investment to demonstrate Training Program effectiveness. Survey participants and managers six weeks following the program to assess the productivity of participants as influenced by the Training Program.

Summary

We have found the ICS to form a valuable component of Extended Training Programs by offering program participants the opportunity to overcome the challenges of technology integration in the classroom setting rather than in the pressure packed atmosphere of a real project. In summary, we have shown:

- Extended Training Programs (ETPs) form a niche within the Technical Training industry that cater to organizations with broad and immediate skill gaps.
- ETPs are often conducted as a series of otherwise independent Courses
- Technical Courses typically include Lab Exercises focused on the relevant technology
- The designers of ETPs often fail to address the skill gaps present in integrating Target Technologies together
- An Integrated Case Study (ICS) is a non-trivial Lab Exercise designed specifically for use within an ETP that requires participants to utilize diverse skills covered by the program. An ICS is a non-trivial problem that encompasses one or more phases of the Software Development Lifecycle, and is designed to achieve specific learning goals.
- Integrated Case Studies pose certain challenges for both the program Sponsor and Training Provider
- The advantages of incorporating an Integrated Case Study into any Extended Training Program are significant.
- No Training Program should be designed without consideration of how a ICS could improve the effectiveness of the training investment.

Affinity IT, LLC

Affinity IT, LLC provides Web Application Development Training and Software Consulting Services. For more than a decade, we have worked with Clients and other Training Vendors to be the provider of choice for technical training. More information about our products and services can be found at www.affinity-it.com .

About The Author

Mr. Fisher holds an undergraduate degree in Computer Science from Merrimack College, and a Graduate degree in Computer Science from Rensselaer Polytechnic Institute. He began developing software professionally in 1986 and has developed and managed many software development efforts since that time.

Mr. Fisher is currently the President of Affinity IT, LLC, a New Jersey based software-consulting firm providing Web Application Development Training and consulting services. In this role, Mr. Fisher has designed and delivered dozens of Extended Training Programs and many Integrated Case Studies.