A COMPARATIVE ANALYSIS OF ISD/SAT PROCESS MODELS

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Abstract

U.S. military services implement the functions of training development, acquisition, and management through process models referred to as Instructional Systems Development (ISD) or Systems Approach to Training (SAT). Due to differences in their missions, organizational structure, defense systems, training delivery systems, and training product formats, the services have developed distinct variations in their ISD/SAT models. The great reliance now being placed in computers to help perform ISD/SAT analyses makes the exchange of training data, analyses, and products between services difficult to accomplish.

If the services are to effectively and efficiently achieve their training missions, the DoD training community will need to place greater emphasis on Joint Service training and the sharing of training data and analysis products. To foster the flow of training data between services, a Joint Service management initiative, named the Automated-Training Evaluation, Acquisition, and Management (A-TEAM) program, was undertaken from 1992 through 1995 to establish commonality, compatibility and interoperability in Department of Defense (DoD) training systems development and management. A key issue examined by the A-TEAM was the degree of commonality between the service-specific ISD/SAT processes.

This paper describes results of a comparative analysis performed on the ISD and SAT models used by the military services. The specific models analyzed include:

Service	Model	Key Documents
Air Force	ISD	AF Manual 36-2234 and AF Handbook 36-2235 series
Army	SAT	U.S. Army Training and Doctrine Command (TRADOC) Regulation 350-7 and TRADOC Pamphlet 351 series
Coast Guard	ISD	Commandant Instruction (COMDTINST) 1550.9 and the Coast Guard Job and Task Analysis Aid
Marine Corps	SAT	Marine Corps Combat Development Command (MCCDC) SAT Guide and other related references
Navy	ISD	Naval Education and Training (NAVEDTRA)-130, -131, and -135

This analysis also aligned Military Standard (MIL-STD) 1379D tasks with the SAT/ISD models described above. As an ISD benchmark, the 1975 Interservice Training Review Organization (ITRO) ISD methodology (described in the rescinded NAVEDTRA-106A and TRADOC Pamphlet 350-30) provided the initial framework for the Joint Service process model.

The A-TEAM ISD/SAT comparative analysis produced two outputs. First, an all-encompassing “Master List” of DoD Training Development processes was identified. Second, a series of conclusions demonstrating that, although challenging and difficult, the successful exchange of training data and products across the services is possible regardless of ISD or SAT model differences.

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INTRODUCTION

The U.S. military services have been successfully using Instructional Systems Development (ISD) and Systems Approach to Training (SAT) methods and procedures for over twenty years to develop training and training systems (Saettler, 1968). The service-specific models that have evolved contain many common processes, but also contain numerous steps and procedures that are unique to the individual Services. These service-specific training development and management processes reflect and support their unique mission, training vocabulary, system analysis requirements, training organization and management philosophies, and documentation requirements.

A-TEAM Program

In July 1995, the U.S. Air Force Armstrong Laboratory concluded the Automated-Training Evaluation, Acquisition, and Management (A-TEAM) program. The A-TEAM was a three year Department of Defense (DoD) initiative to examine the feasibility of establishing commonality, compatibility, and interoperability in the development and implementation of DoD training systems, tools, and methodologies. Within the A-TEAM, the Functional Description Special Team (FDST) completed a major project identifying computerized training development and management tools, describing these tools, and aligning the capabilities of these tools to a master list of DoD training processes.

To assess the capabilities and potential interoperability of automated training development tools, the A-TEAM developed an automated management tool called the A-TEAM Process Mapper. The A-TEAM Process Mapper stores the service-specific ISD/SAT processes and aligns a service or DoD training development process model to its counterparts in the other services. Central to the Process Mapper was the A-TEAM DoD "Master List" of Training Development processes. The "Master List" provides the foundation for comparing and contrasting service and DoD training development processes. Each process in this list is either unique or common to two or more services/sources.

Need for ISD/SAT Comparative Analysis

The A-TEAM program specifically required an ISD/SAT Comparative Analysis as its building block for the Master List of Training Development Processes. But the need for a current comparison of ISD/SAT processes is considerably more fundamental than that immediate requirement. Current trends in DoD downsizing and in the associated cutbacks in training resources virtually ensure a greater DoD dependence on Joint Service training, as well as sharing training resources and information.

Many training developers and managers express concern that their service-specific requirements are so unique that they preclude the use of other services' training materials and information. This situation prompts the following questions:

- Are some processes within the service-specific ISD/SAT models interchangeable?
- Can information be reasonably exchanged during the implementation of these models?
- Are there sufficient similarities across the ISD/SAT models that a DoD Master List of Training Development Processes could be prepared?

These questions could be answered by assembling and analyzing the information in the A-TEAM Process Mapper,

Previous ISD/SAT Comparisons

The A-TEAM ISD/SAT Comparative Analysis had an advantage in that several excellent previous analyses had been undertaken and provided an analytical starting point. Several excellent sources included:

- *History of ISD Concepts*, (Shriver, 1978);
- *Current Research Programs in ISD*, (McClelland, 1978);
- *The Interservice Procedures for Instructional Systems Development*, (Branson, 1978);
- *Centralized Course Development in the Navy*, (Scanland, 1978);
- *The Instructional System Development Manual: Tool or Tyrant*, (Montermerlo, 1979);
- *Chapter 12 - Instructional Technology: A History*, (Reiser, 1987) in *Instructional Technology: Foundations*, by Dr. Robert Gagne;
- *Chapter 15 - Instructional Systems Development*, (Branson and Grow, 1987) in *Instructional Technology: Foundations* by Dr. Robert Gagne;
- *Systems Concepts for Training System Development*, (Hayes, 1992).

More direct application included:

- *Comparative Analysis of Models of Instruction*, (Andrews and Goodson, 1980) - which compared the 1975 ITRO ISD model with other ISD methodologies.
- *The Instructional Systems Development Model and Systems Engineering*, (Ball, 1984) - which compared ISD with Systems Engineering techniques and procedures.
- *A Comparative Analysis of ISD Procedural Models,* (Schaefer, 1985) - Proceedings of the 1985 Interservice/ Industry Training Equipment Conference (I/ITEC).

COMPARATIVE ANALYSIS

ISD/SAT Models Examined

To accurately portray a DoD Master List of Training Development processes, the A-TEAM FDST examined key ISD/SAT doctrine from each service and from two widely accepted DoD sources. A "Master List" of ISD/SAT processes linked to each Service/DoD source was developed and coordinated for review and edits within the A-TEAM's multi-service membership. The following ISD/SAT models and procedures were examined:

- Air Force ISD: Air Force (AF) Manual 36-2234 and AF Handbook 36-2235.
- Army SAT: U.S. Army Training and Doctrine Command (TRADOC) Regulation 350-7, and TRADOC Pamphlets 351-12, 351-13, and 351-14.
- Coast Guard ISD: Commandant Instruction (COMDTINST) 1550.9 and the Coast Guard Job and Task Analysis Guide.
- Marine Corps SAT: Marine Corps Combat Development Command (MCCDC) SAT Guide and Fleet Marine Force Manual (FMFM) 0-1.
- Navy ISD: Naval Education and Training (NAVEDTRA)-130, -131, and -135.
- Interservice Training Review Organization (ITRO) ISD: NAVEDTRA

	June 1995	TABLE 1 - COMPARISON OF MILITARY TRAINING DEVELOPMENT PROCESSES - PART I			
	ISD/SAT PHASES	TRIDED	AIR FORCE ISD	ARMY SAT	COAST GUARD ISD
		NAVEDTRA 106A/TRADOC Pam 350-30	AF Manual 36-2234 & AF Handbook 36-2235	TRADOC Pam 351-12/-13/-14 & Reg. 350-7	COMDTINST 1500.9 and JOB & TASK ANALYSIS AID (DRAFT)
LINE #					
1	I. ANALYZE	I. Analyze	I. Analyze	I. Analyze	01. Analyze
2			I.1 Perform Mission Analysis	I.1 Conduct Mission Analysis	
3					
4					
5			I.1.5 Perform Collective Task Analysis	I.2 Perform Collective Task Analysis	
6		I.1 Analyze Job	I.2 Perform Occupational/Job Task Analysis	I.3 Perform Job Analysis	01.01 Analyze Job
7					01.01.x Develop Tasks Using Equip. Anal. Method
8			I.3 Perform Educational Analysis		
9		I.2 Select Task/Functions	I.4.7 Select Tasks for Instruction	I.4 Select Tasks	01.03 Select Tasks
10		I.3 Construct Job Performance Measures	I.4 Perform Training Task Analysis	I.5 Perform Individual Task Analysis	01.05 Conduct Task Analysis
11					01.06 Conduct Content Analysis
12					
13					
14			I.5 Perform Learning Analysis		
15				I.6 Develop Mission Training Plans	
16				I.7 Develop Soldier's Training Publications	
17					
18		I.4 Analyze Existing Courses			
19		I.5 Select Instructional Setting		II.5 Select Instructional (Site) Setting	
20					01.04 Conduct Job Aid Analysis
21					
22	II. DESIGN	II. Design	II. Design	II. Design	02. Design
23		II.3 Describe Entry Behavior	II.6 Perform Target Audience Analysis	II.1 Describe Target Population	01.02 Define Target Population
24		II.1 Develop Objectives	II.1 Develop Objectives	II.2 Write Learning Objectives	02.01 Develop Objectives
25			II.1.6 Develop Hierarchy of Objectives	II.3 Construct Learning Analysis Hierarchy	
26		II.2 Develop Tests	II.2 Develop Tests	II.6 Design Tests	02.02 Develop Test Items
27		II.4 Determine Sequence and Structure	II.1.7 Prioritize, Cluster & Sequence Objectives	II.4 Sequence Learning Objectives	02.03.01 Sequence Terminal Learning Objectives
28					
29		III.2 Specify Instruction Management Plan	II.4 Design Instructional Plan	II.7 Select Learning Strategy	02.03 Develop Instructional Strategy
30					
31		III.1 Specify Learning Events/Activities		II.9 Select Learning Events/Develop Activities	
32		III.2.2 Make the Media Selection	II.4.2 Select Media	II.8 Select Media and Methods	02.03.04 Describe Media Usage
33					
34					
35					
36				II.10 Design Training Products	
37					02.04 Develop (Initial/Draft) Curriculum Outline
38			II.5 Design Instructional Info. Mgmt. System		
39	III. DEVELOP	III. Develop	III. Develop	III. Develop	03. Develop
40		III.3 Review/Select Existing Materials	II.3 Review Existing Materials	III.1 Review Existing Materials	03.01 Review/Select Existing Materials
41				III.2 Revise or Develop Materials	03.02 Develop (Instructional) Materials
42					
43		III.4.5.1.1.7 Prepare Plan of Instruction	III.1 Prepare Plan of Instruction/Course Syllabus	III.3 Prepare Program of Instruction	03.02.01 Develop Curriculum Outline (CO)
44					
45		III.4.5.1 Develop Instructor Guide (IG)	III.1.8 Prepare Lesson Plans	III.4 Develop Lesson Plans	03.02.04 Develop Instructional Guides
46					
47		III.4.5.2 Develop Student Guide (SG)	III.2 Produce Instructional Materials	III.4.9 Prepare/Identify Student Handouts	03.02.03 Develop Instructional Manuals
48					
49		III.4 Develop Instruction	III.2 Produce Instructional Materials		03.02.06 Develop Non-Print Media
50		III.5 Validate Instruction	III.3 Validate Instruction	III.5 Validate Training Materials and Production	03.03 Validate Materials
51			III.4 Finalize Instructional Materials		03.04 Revise Course
52				III.6 Obtain Development Approval	
53				III.7 Plan Staff, Faculty & Cadre Training	
54				III.8 Maintain Development Audit Trail	
55	IV. IMPLEMENT	IV. Implement	IV. Implement	IV. Implement	04. Implement
56		IV.1 Implement Instructional Mgmt. Plan	IV.1 Implement System Functions		
57					
58				IV.1 Train Staff, Faculty & Cadre	
59		IV.2 Conduct Instruction	IV.2 Conduct Instruction	IV.2 Conduct Training	04.01 Conduct Instruction
60					
61			IV.3 Conduct Operational Evaluation		
62				IV.3 Maintain Implementation Audit Trail	
63	V. EVALUATE	V. Evaluate/Control	V. Evaluate	V. Evaluate	05. Evaluate
64		V.1 Conduct Internal Evaluation		V.1 Conduct Internal Evaluation	
65					
66			V.1 Perform Formative Evaluation		
67			V.2 Perform Summative Eval. & Oper. Tryouts		
68		V.2 Conduct External Evaluation		V.2 Conduct External Evaluation	05.02 Conduct External Evaluation
69			V.3 Perform Operational Evaluation		
70					
71					05.01 Develop External Evaluation Instruments
72				V.3 Conduct Evaluation Follow-Up	05.03 Analyze External Evaluation Results
73		V.3 Revise System	IV.3.4 Revise Instructional System	V.4 Revise and Re-Use Instruction	05.04 Revise Course Where Necessary

106A and TRADOC Pamphlet 350-30. Both have been rescinded.

Military Standard (MIL-STD) 1379D, Military Training Programs. MIL-STD-1379D identifies training development and management tasks to be completed by contractors in support of military training requirements.

Table 1, Comparison of Military Training Development Processes, contains a high level listing of "Master List" Processes. This Table also depicts the alignment of processes across each source/service-specific process. Each service/source has its own columns for training development processes segregated by ISD/SAT phase. The right-most column labeled "A-TEAM/DoD MASTER PROCESS LIST" provides the common alignment point for each source.

TABLE 1 - COMPARISON OF MILITARY TRAINING DEVELOPMENT PROCESSES - PART II			June 1995	
MARINE CORPS SAT MCCDC SAT GUIDE and FMFM 0-1	NAVY ISD NAVEDTRA 130 (Tasks), - 131 (PPP), & - 135, and OPNAVINST 1500.8, 1500.73, 1560.8, & 1560.51	DoD MILITARY TRAINING PROGRAMS MILITARY STANDARD 1379D	A-TEAM DoD MASTER PROCESS LIST	LINE #
I. Analyze	**I. Analyze**		**1 Analyze**	1
I.1 Conduct Mission Area Analysis	I.1 Perform Mission Analysis	201.02.01 Conduct Mission Analysis	1-01 Conduct Mission Analysis	2
I.2 Analyze Mission				3
I.4 Produce Mission Essential Task List				4
I.6 Analyze Collective Tasks		201.02.03 Perform Collective Training Task Analysis	1-02 Perform Collective Task Analysis	5
I.3 Analyze Job	I.3T Develop Course Training Task List	201.02.10 Conduct Occupational Analysis	1-03 Conduct Occupational Analysis	6
	I.3P Develop PPP Tables: Equip/Sys/Subsys. (ESS)	201.02.07 Develop Personnel Performance Profiles (PPP)	1-04 Perform Equipment Task Analysis	7
			1-05 Perform Educational Analysis	8
I.5 Produce Individual Task List		201.02.04.02 Select Tasks for Training	1-06 Select Tasks	9
I.7 Analyze Individual Tasks	I.2 Perform Task Analysis	201.02.04 Perform Individual Task Analysis	1-07 Perform Individual Task Analysis	10
				11
	I.4 Develop PPP Tables: Tasks/Functions			12
	I.5P Develop Training Path System Requirements	201.02.08 Develop Training Path System Requirements		13
				14
I.8 Develop Mission Performance Standards				15
I.9 Develop Individual Training Standards		202.02.09 Develop Individual Trng. Standards Sys.		16
		202. Assess Training Technology	1-08 Assess Training Technology	17
				18
I.10 Determine Instructional Setting	I.5P.3 Id. Trng. Path Sys/PPP Trng. Level Assigned	203.02.08 Determine Instructional Setting for Tasks	1-09 Select Instructional Setting	19
				20
I.11 Conduct Unit Training Assessment				21
II. Design	**II. Design**		**2 Design**	22
II.1 Determine Target Population Description		201.02.01 Identify Target Population Prerequisites	2-01 Identify Target Population	23
II.3 Write Learning Objectives	II.1 Write Learning Objectives	203.02.04 Develop Learning Objectives	2-02 Develop Learning Objectives	24
II.2 Conduct Learning Analysis	II.2 Perform Learning Analysis	203. Learning Analysis	2-03 Perform Learning Analysis	25
II.4 Write Tests Items	II.4 Develop Test Items	205. Tests for Measurement of Personnel Achievement	2-04 Develop Tests	26
II.6 Sequence Terminal Learning Objectives	II.3 Sequence Learning Objectives	203.02.09 Develop Learning Objective Sequence	2-05 Sequence Learning Objectives	27
		203.02.12 Develop Course Structure and Sequence		28
II.5 Select Delivery System		203.02.17 Determine Instructional Methodology	2-06 Determine Instructional Strategy	29
				30
	II.5 Identify Course Divisions			31
II.5.6/.7 Select Instructional Method(s) & Media	II.6 Select Media	204. Perform Media Selection	2-07 Select Media	32
	II.7 Identify Media Features			33
		207. Identify Training System Modification Requirements	2-08 Id. Trng. Sys. Modification Requirements	34
		208. Identify Training System Functional Requirements	2-09 Id. Trng. Sys. Functional Requirements	35
	II.8 Design Training System	211. Design Instructional Media	2-10 Design Media	36
				37
				38
III. Develop	**III. Develop**		**3 Develop**	39
III.1.1 Review Source Doc/Existing Instruction			3-01 Review Existing Instruction	40
III.2 Develop Instruction				41
III.5 Develop Course Descriptive Data	II.9 Develop Training Course Control Document	106.02.01 Develop Course Descriptive Data		42
III.6 Develop Program of Instruction	II.9.1 Develop Curriculum Outline of Instruction	106.02.03 Develop Course Present Schedule Chart	3-02 Develop Course Syllabus	43
		203.02.12 Develop Course Structure and Sequence		44
III.2.3 Develop Instruction (LP/Student Materials)	III.1 Develop Lesson Plans	210. Develop Lesson Specifications	3-03 Develop Lesson Plans	45
		303. Develop Instructor Training Materials		46
III.2.3 Develop Instruction (LP/Student Materials)	III.2 Develop Trainee Guides	304. Develop Trainee Training Materials	3-04 Develop Trainee Training Materials	47
	III.3 Develop Test Package	205. Develop Achievement Measurement Tests		48
III.3 Develop Media	III.4 Develop Instructional Media Material	301. Produce Instructional Media	3-05 Develop Instructional Media	49
III.4 Validate Instruction	III.5 Validate Instruction	402.02.07 Conduct Training Materials Validation	3-06 Validate Instruction	50
	III.6 Finalize Instructional Materials			51
				52
				53
				54
IV. Implement	**IV. Implement**		**4 Implement**	55
IV.2 Prepare for Instruction			4-01 Prepare for Instruction	56
IV.1 Prepare for Unit Training				57
	IV.1 Training Instructional Staff			58
IV.4 Conduct Instruction	IV.2 Conduct Instruction	401. Conduct Training	4-02 Conduct Instruction	59
IV.3 Conduct Unit Training				60
				61
				62
V. Evaluate	**V. Evaluate**		**5 Evaluate**	63
	V.1 Perform Internal Evaluation and Feedback	402. Evaluate Training	5-01 Perform Internal Evaluation	64
V.1 Plan and Conduct Evaluation				65
				66
				67
	V.2 Perform External Evaluation and Feedback	402. Evaluate Training	5-02 Perform External Evaluation	68
				69
V.3 Perform (Evaluation) Data Management				70
				71
V.2 Analyze and Interpret Evaluation Data				72
V.4 Revise Training Plan/Instruction		402.02.09 Dev/Submit Approval Change Crit. Procedures	5-03 Revise Instruction	73

Analytical Method

Each ISD/SAT model was examined to obtain an understanding of its evolution, to identify basic differences and the causes of these differences between the service-specific models, and to develop a technique for presenting the differences between the models.

1. The membership of the A-TEAM FDST, identified, acquired and reviewed the ISD/SAT references for their service.
2. The key ISD/SAT reference material, with subject matter expert (SME) review, was examined to determine the functional processes contained in the service's ISD/SAT model.
3. The ISD/SAT model processes were aligned to their counterpart processes

from the other ISD/SAT models. The accuracy of this alignment effort was the most difficult aspect of this comparative analysis. Constant re-examination of the ISD/SAT references and continued coordination with the multi-service membership of the A-TEAM FDST ensured accurate alignments.

4. Finally, a proposed DoD "Master List" of ISD/SAT Training Development Processes was completed using the aligned source/service-specific ISD/SAT processes as its foundation. A master process describes the combination of the aligned source/service-specific processes or the actual source/service-specific process, if only one exists. -- This DoD "Master List" was used within the A-TEAM Process Mapper as a common basis for comparing the capabilities of existing DoD training development tools.

Analytical Lessons Learned

This section addresses the difficulties, opportunities, and findings encountered when comparing the ISD/SAT processes of the U.S. military services.

Product vs. Process Orientation

Some of the service-specific ISD/SAT references are quite explicit in identifying the processes, their definition, scope, sequence, and sub-processes/steps. The 1975 ITRO ISD provided extensive detail about its processes and the suggested sequencing of the processes. Likewise, the ISD/SAT doctrine for the Air Force, Army, Marine Corps, and Coast Guard generally provide a recommended sequencing of process completion with a description of each process.

The Navy, with its recently published NAVEDTRA-130, -131, and -135 have written their doctrine with the orientation toward products, e.g., Lesson Plans, Trainee Guides, Tests for Measurement of Trainee Achievement, Curriculum Outline of Instruction, and Training Course Control Documents. The training development and management tasks described in MIL-STD-1379D are also written in a product, rather than process, oriented manner. However, the figures in Appendix A of MIL-STD-1379D do identify "task input/output relationships" as well as a "task flow to systems approach to training".

It is not within the purpose of this study to offer any conclusion as to which doctrinal format is superior. This study simply acknowledges the difficulties associated with developing a process flow from product oriented reference material.

Levels of Indenture

Levels of indenture represent the hierarchy of processes for each service/source and the A-TEAM/DoD Master Process List. 1 Analyze represents the first level of indenture. 1-01 Conduct Mission Analysis represents the second level of indenture, and MIL-STD-1379D's 201.02.01 Conduct Mission Analysis represents the third level of indenture. Table 1 shows up to six levels of indenture.

Table 1 provides many good examples of level of indenture differences in process definition across the services. For example, the training development processes (A-TEAM Master Process 3-02) of a Curriculum Outline/Syllabus or Plan/Program of Instruction (POI) is identified at the second level of indenture within the Air Force, Army, and Marine Corps. The Coast Guard and Navy place their Curriculum Outline

Table 1. Comparing Levels of Indenture

ITRO ISD	AIR FORCE ISD	ARMY SAT	COAST GUARD ISD	MARINE CORPS SAT	NAVY ISD	A-TEAM/DoD MASTER PROCESS LIST
III. Develop	**III. Develop**	**III. Develop**	**03. Develop**	**III. Develop**	**III. Develop**	**3 Develop**
III.3 Review/ Select Existing	II.3 Review Existing Materials	III.1 Review Existing Materials	03.01 Review/ Select Existing	III.1.1 Review Source		3- 01 Review Existing
		III.2 Revise or Develop	03.02 Develop (Instructional)	III.2 Develop Instruction		
				III.5 Develop Course	II.9 Develop Training Course	
III.4.5.1.1.7 Prepare Plan of Instruction	III.1 Prepare Plan of Instruction/ Course Syllabus	III.3 Prepare Program of Instruction	03.02.01 Develop Curriculum Outline (CO)	III.6 Develop Program of Instruction	II.9.1 Develop Curriculum Outline of Instruction	3- 02 Develop Course Syllabus

development at the third level of indenture. ITRO ISD, with its very detailed process descriptions, has Plans of Instruction at the sixth level. Table 2, Comparing Levels of Indenture, clearly shows these distinctions. The difference in levels of indenture is not necessarily an indicator of differences in emphasis, or in the level of detailed guidance provided by the service. Differences in levels of indenture may simply reflect the level of process indenture identified in the ISD/SAT references used. In most instances, the differences in level of indenture reflect perfectly reasonable considerations such as:

- Differences in doctrinal writing styles;
- The level of detail in which the reference addresses/describes ISD/SAT processes; and
- doctrinal interpretation by the A-TEAM FDST.

Some services choose to provide procedural guidance only at a very high level of indenture. For example, most services provide guidance on the preparation of Lesson Plans and Trainee Materials (e.g., Student Guides, Student Handouts, etc.). As indicated in Table 1, the Marine Corps' MCCDC SAT Guide identifies one combined process (III.2.3 - Develop Instruction) as being equivalent to what the other services consider to be two distinct processes. This situation could be a reflection of the USMC's acknowledgment that it frequently trains Marines in courses managed by other services. Therefore, a USMC-specific Lesson Plan or Trainee Materials might be better defined by subordinate USMC training commands or by the other service's managing the Joint Service training.

Training Responsibility Delegation

The manner and organizational philosophy that a service delegates its training responsibilities has a direct impact on defining its doctrinal processes. For example, the Army's TRADOC doctrine is often very precise in how it requires training development processes to be performed. Recommended Task Selection Models are provided in TRADOC Pamphlet 351-13. Generally, the TRADOC proponent schools are expected to adhere to these process guidelines. The Air Force doctrine (AF Manual 36-2234) provides broad task selection guidelines, but basically leaves the Task Selection Model identification and its criteria to the individual Training Squadrons and Wings.

The Navy's doctrine identifies completed training products. It generally allows the individual training commands to develop and implement their own procedures for developing the required training products. The Navy may have developed this training philosophy in response to its' diverse training requirements, directly related to unique environments addressed by the often-referred-to "four different Navies": Land, Air, Sea, and Submarine.

Doctrinal Timeliness

The timeliness of the doctrine is a definite consideration. The 1975 ITRO ISD provided a solid starting point for ISD/SAT process definition for many years. But in twenty years, ISD and SAT procedures and techniques have been refined considerably. Hence, the ITRO ISD model was rescinded in 1990-1992 by the Army and in 1993 by the Navy.

The Navy only recently (1993) replaced NAVEDTRA-106A (ITRO ISD) and -110 with its' NAVEDTRA-130 series. Publication of the under-development NAVEDTRA-133 and -134 will complete the Navy's ISD doctrinal series. Although these references identify no Navy requirement to complete Collective Task Analyses, the Navy is currently undertaking efforts to develop a Mission Essential Task List (METL). METL doctrine will, in turn, undoubtedly be developed soon.

The Air Force also recently (1993-1995) updated its ISD doctrine with the publication of AF Manual 36-2234 and the 11 volumes of AF Handbook 36-2235.

The final release of TRADOC Regulation 350-XX, *Training Development Process, Management, and Product*

Development, may be complete by the time this article is published. It is certainly reasonable to assume that some significant changes are likely. Even the USMC has indicated that the MCCDC's SAT Guide is being significantly revised and may be republished soon.

Other Considerations

The alignment of training development processes from multiple DoD sources is also impacted by a series of other factors, some of which are briefly described below:

- The ISD/SAT doctrine of some services includes both training development and management processes. A clear distinction between Development processes and Management processes would be advisable.
- Unfortunately, Coast Guard SME representation within the A-TEAM FDST was minimal. A review of the Coast Guard Master Process List might have provided some changes to the information presented.
- Initially the A-TEAM Process Mapping effort was undertaken with a "bottom-up" approach, which attempted to identify ISD/SAT processes nearly at the data element level. Although the information gathered was precise, the volume of information became unwieldy. Ultimately, a "top-down" approach proved more successful.
- Due to time and resource constraints, the additional information available within the Data Item Descriptions (DID) cited by MIL-STD-1379D were not examined in detail. As MIL-STD-1379D was the most recent DoD doctrine describing Joint Service training development and management tasks/processes, it is reasonable to assume that examining the DID may have provided some additional definition to the A-TEAM/DoD Master Process List.

CONCLUSIONS

This comparative analysis has reached many of the same high-level conclusions as Robert Schaefer's 1985 study:

- No one single training document completely covers all the training data and processes required to produce military training and training systems.
- Although each service has its' unique requirements and training philosophies, at the highest process levels (three levels of indenture and less) there is considerable similarity and potential for developing a DoD standard of integrated training development processes. - At the fourth level of indenture and greater, the A-TEAM comparative analysis frequently identified service-specific processes rather than DoD processes.
- The process of developing training materials and systems could be made more resource-effective if the individual Service's could share training information and material by utilizing a comprehensive and integrated ISD/SAT model.

DoD Master List of ISD/SAT Processes

A greater emphasis on Joint Service and Joint training is clearly the future of the U.S. Armed Services training community. Integration and standardization of training development processes would ensure that new training materials and systems would be developed in a manner which is the most resource-effective and produces the highest quality materials, regardless of which service had the proponency for its development or acquisition.

Training Data and Product Exchange

The Comparison of Military Training Processes can provide training managers and commanders for each service with the means to identify common points in analytical, design and development training processes. By aligning organizational responsibility, procedural guidance, and

training tool alignments with the Service-specific training development processes, and in turn a DoD Master List, training managers and commanders could readily identify their other-service counterparts and the efforts of these counterparts. Such information would greatly enhance any services ability to integrate training information and materials, thus saving increasingly scarce training resources.

The A-TEAM Process Mapper, which makes extensive use of this comparative analysis research, aligns the capabilities of training tools to the A-TEAM/DoD Master List of Training Development Processes. This information can clearly depict the potential for data exchange.

Recommendations

The research developed under the A-TEAM Program and discussed within this paper provided the following recommendations:

- There is a need for DoD Master Process List of ISD/SAT Training Management Processes. This effort would probably be more difficult than the training development processes, due to service-specific differences in managerial styles, training documentation requirements, and training organizational structures and responsibilities. Ultimately the Training Development Processes would have to be aligned with the appropriate Training Management Processes.
- DoD ISD/SAT doctrine should be written in a process oriented manner, which would better explain the sequence and relationship between training processes and products. Guidance on training products would be extremely valuable, but should be included as Appendices to the DoD ISD/SAT process-oriented doctrine.
- There is a need for DoD Master List of ISD/SAT Training Development Processes. Use of business process re-engineering, with Integrated Computer Aided Manufacturing Definitions (IDEF) modeling, is strongly suggested to configure the current "as-is" approach for all services in order to better develop a "Master" or "to-be" models. This will help to lay the groundwork for a Training Corporate Information Management (CIM) initiative. A CIM will increase military effectiveness while meeting the services' functional cost reduction targets and deploying technology in support of functional cost reduction and effectiveness objectives.

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