

# *lean-ISD*

*ISPI Master Series Presentation 2001*

*by Guy W. Wallace*

## ***lean-ISD***

John Swinney asked me to be a part of his Masters Series at the 2001 ISPI conference. He said, tell the history of CAD. CAD is curriculum architecture design, one of my firm's ISD methodology sets. I have been doing them since 1982. I have done 70 to date. I have presented on CAD and CADs at over 10 ISPI conferences and at 7 local chapter meetings in the past 20 years. CAD is one of three levels of ISD design in what we call the PACT Processes for T&D. All three levels of ISD design are lean.

The PACT Processes for T&D are a set of ISD...Instructional Systems Design (or Development) methodologies authored and practiced and evolved over the past 21 years by myself, and my business partners Pete R. Hybert and Kelly R. Smith. They are performance oriented and practitioner honed.

If one could design a set of collaborative processes involving ISD customers and suppliers with a set of phases and tasks proscribed, with a robust set of tools and templates to quickly and efficiently engage the right people at the right time to produce high quality, performance improving training and development using a object/chunking design and development strategy of both shareable and unique modules for deployment in any mode...group-paced or self-paced or individually coached...then you would have achieved what we also set out to accomplish. Lean-ISD.

## ***The Concept of lean***

The concept of *lean* comes from the M.I.T. study in 1990 that looked at the worldwide automotive industry and practices and compared them all to Japan's lean production system, in the book titled *The Machine That Changed the World*.

The *lean* approach is most prevalently applied to engineering and manufacturing processes, but it is not limited to those processes. The goals in these *lean* applications are to

- ❑ Use the best of mass and craft production methods.
- ❑ Reduce costs and cycle times.
- ❑ Improve product and process quality and customer satisfaction.

## ***The lean-ISD Concept***

The application of *lean* to the world of ISD should create a set of common, effective, and efficient processes for the entire ISD process that spans project planning and management, analysis, design, development, pilot-test deployment, and evaluation of T&D.

These *lean-ISD* processes would allow for

- ❑ Dividing the ISD project efforts across multiple T&D organizations, locations, and personnel while ensuring that all of the T&D pieces will fit together for a *seamless* learning experience for the learners
- ❑ Planning and managing predictable projects with predictable schedules and resource consumption (peoples' time and out-of-pocket costs)
- ❑ The development of both shareable and unique T&D Modules (T&D product subassemblies) that are components of a systems view of the entire T&D product line
- ❑ The reuse (with little or no customization required) of the T&D products and subassemblies for various target audiences from across the organization
- ❑ The involvement and collaboration of both upstream suppliers and downstream customers

### ***The State of ISD Today***

ISD is instructional systems design or instructional systems development, depending on your source. It's been making the headlines lately. According to the press, the death knoll has been sounded. ISD is too slow and too ineffective for life at Internet speed.

Is ISD dead? I don't think so. Is ISD dying? No. Is ISD hurting? Definitely.

ISD has been slowly evolving since its early days, created for the US military in the 1940's. Then the military and all of the industries it directed put it to use for *mission critical* things, helping to ensure that tanks rolled, ships sailed, planes flew, and that supplies reached troops all the way up to the front lines. Situational-ly, it was do or die. No kidding! Today? Today is different.

Too many things are just not thought that mission critical in the enterprise operating at Internet speed today. And too often the wrongs things are seemed and deemed important and not.

Today too many enterprise initiatives are using Knowledge Management Systems to cram all sorts of "e" content into electronic warehouses wired to each and every employee. But doing it without regard to the total life cycle costs of creating, administering, and then maintaining the thousands *knowledge module objects*. Not good.

They should regard those life-cycle costs, so that it doesn't end up as a warehouse full of *past-its-time* thinking and models. Only build it if they'll log on **and** you'll maintain it, or at least delete it when obsolete.

Will the Internet kill ISD? No. It will better enable it. It will help it get *lean*. But it's not the only component in what we at CADDI have labeled (and trademarked for our newsletter and my book) *lean-ISD*. And by *lean-ISD* we mean **performance-based** *lean-ISD*.

The ultimate goals of ISD processes are to create instruction that is effective and efficient. Yes? Good ISD processes are also themselves effective and efficient. Yes? If you're with me so far, then you'll probably go for the notion that the ultimate goal of training & development (T&D) is *improved performance* by the *learners* as measured by *enterprise metrics*. Metrics such as cycle times, deadlines, costs, returns, lost opportunities, safety, and a myriad of other stakeholder satisfaction items are much more important than *days delivered* alone.

These business-type metrics apply equally to both the suppliers and the customers of T&D. The customer uses these measures in those targeted operations, both pre and post T&D deployment. The supplier uses these same measures in their T&D development operations. But the supplier's metrics only help us understand what it took to get the T&D there, available for deployment, and then to deploy it to its targets. That is the focus of lean-ISD...the supplier side. It's about how to do performance-based T&D, and do it lean. But still the ultimate measure of T&D, lean or otherwise, is outside the T&D System box.

With T&D, it's not really important that someone learned something, even to a very high proficiency, if what was learned had a miniscule impact on the enterprise given its costs.

All of the supplier and customer metrics lead to ultimate measures such as return on investment (ROI), economic value add (EVA), reduced future costs, and the potential returns on other reinvested savings are how T&D product quality are the best measures of T&D effectiveness and efficiency. Hey, a dollar saved is a dollar earned, a dollar generated with less than a dollar of expense expands the profitability of the enterprise, etc.

All T&D efforts incur a cost to produce a gain. Why spend \$100,000 to gain back only \$80,000? You wouldn't if it were your money, so why would the corporation's shareholders feel differently?

## ***ISD Models***

ISD, Instructional Systems Design/Development, is the label placed on efforts to plan, analyze, design, develop, implement and evaluate T&D. There are various models in the literature that describe ISD, including the "big block diagram" also known as "ADDIE," from the work of the aforementioned Robert Gagne, Leslie Briggs, Robert Morgan, and Robert Branson.

There are many other ISD models—almost as many as there are ISD practitioners. Therein lies part of the problem for most organizations. In too many organizations, there are too many ISD models being followed. They are typically not common and not predictable in terms of the quality of the T&D outputs produced, or their costs and schedules, and they are not *in control*. They are often not visible to T&D management or to T&D customers.

This typically results in an ISD situation where

- ❑ Content of the product line elements (courses, CBT, OJT programs, etc.) are both gapped and overlapping in terms of their content.
- ❑ It is costly to produce in the first place, and more costly to maintain.
- ❑ It is costly to deploy.
- ❑ It is impossible to predict development schedules and costs and then predict return on investment (ROI).
- ❑ The look and feel of the T&D varies across the product line, and chunks of potentially shareable T&D aren't designed with reuse in mind.

Many organizations have a significant opportunity in recovering and reducing resource expenditures for their ISD processes for producing T&D. They need to re-engineer their ISD processes.

The ultimate goal of the T&D is *improved performance* by the *learners*. That is how T&D product quality is best measured. The ISD process goals are to create this quality T&D in a reduced cycle time and at reduced costs.

The T&D products must have the desired effect in terms of the incurred learning in the learning environment (whether classroom, CBT, or on-the-job) and, most importantly, the ability to apply those learnings back on the job. The ISD processes must get this job done quickly and cost-effectively.

### ***PACT Processes for T&D***

Over the past dozen years, the partners at CADDI have *reduced to practice* the prevailing ISD concepts, philosophies, methods, processes, and practices. Our efforts to model the ISD process are driven by the same need that has driven many businesses to first model and then re-engineer their core processes: to improve quality and reduce both cycle time and costs.

Many T&D organizations have undertaken efforts to re-engineer their ISD processes to make them *common* across the organization, *predictable* in their schedules and costs, and ensure that the T&D produced is *effective*. We began in the late 1980s and in 1989 coined the term “PACT Processes for T&D” which include:

- ❑ Analysis: Performance Modeling and Knowledge/Skill Analysis
- ❑ CAD: Curriculum Architecture Design
- ❑ MCD: Modular Curriculum Development
- ❑ IAD: Instructional Activity Development
- ❑ PP&M: Project Planning & Management

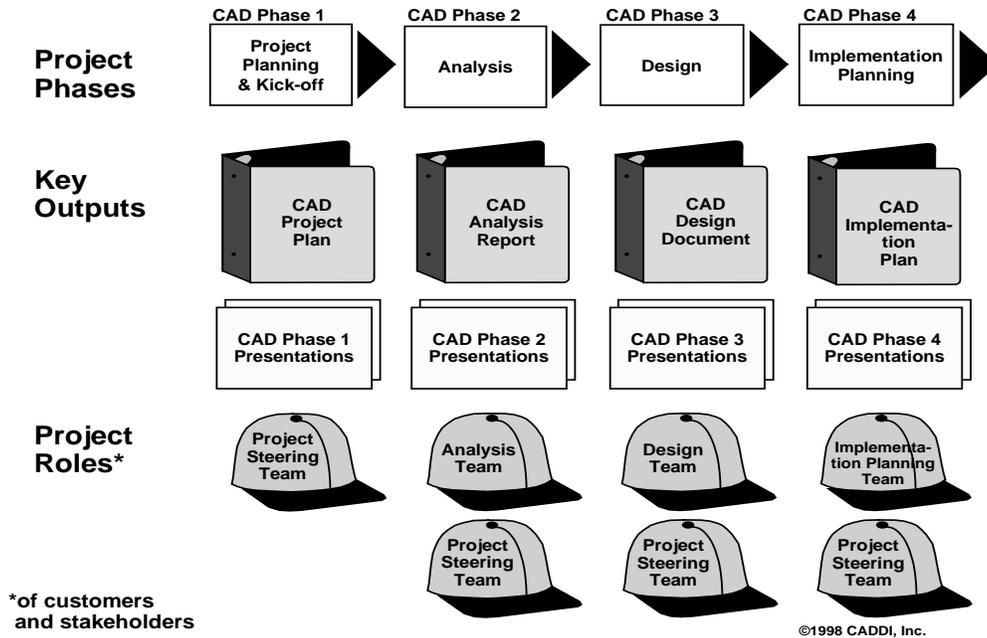
The three ISD processes of the PACT Processes are CAD, MCD, and IAD. Each operates at three distinct, different levels of ISD. Each is driven by the PACT Process Analysis methodologies including Performance Modeling and Knowledge/Skill Analysis (see Phase 2 of each PACT Process model below).

### ***CAD — Curriculum Architecture Design***

This methodology provides a structured, gated, in-control process for the fairly quick design of the overall curriculum architecture, or learning architecture. The design meeting may take two to four days and generate the macro designs for 50 to 150 T&D Events, depending on the size and complexity of each.

The outputs of the performance modeling and knowledge/skill analysis process are used within the CAD process to drive the design to ensure it results in a performance-based orientation instead of a content/subject matter-based orientation.

A CAD Projects phases:



A CAD is built to support job performance. It creates an architecture of T&D Modules where shareable and unique modules of content are used to create performance-based training and development products such as courses; workshops; structured, on-the-job training; CBT programs; book reading assignments; project assignments; etc. These modules can be configured many ways, thus maximizing the share ability of content across various target audiences.

A CAD segments and organizes the content of training to ensure the greatest impact on an organization's performance while minimizing life cycle costs. It helps to prevent the allocation of resources to training that have little or no impact on job performance. Many T&D modules and events are never developed/acquired because there is no positive returns or economic value add. So why bother? You wouldn't if it was your money.

A CAD builds a design for a training curriculum with individual parts that add up to a logical whole within the context of a given job or category of position. It ensures that all training works together to produce the desired results by providing employees with all the knowledge/skills needed to perform. A CAD's modular design includes both shareable and unique modules creating the capability for infusing the enterprise with a more common language, view point/perspective, and culture, and the local unique needs. Generic content chunks and specific content chunks. Then the existing T&D can be assessed for fit. Gaps in the curriculum can be identified.

A CAD project engages the training customer in the prioritization of all training development efforts targeted to fill gaps in the overall architecture of T&D. All of the priority training content really required becomes visibly apparent to the training customer. The customer's knowledge regarding the affect of training on specific areas of performance, allows them to prioritize gap training development efforts that will help them meet their business needs. The collaboration creates many win-wins.

The CAD's architectural design will help reduce the overall life cycle costs of the entire training and development product line. Initial, "first costs" will be reduced by eliminating and minimizing redundant content development. "Life cycle costs" will also be reduced because there will be no redundant content

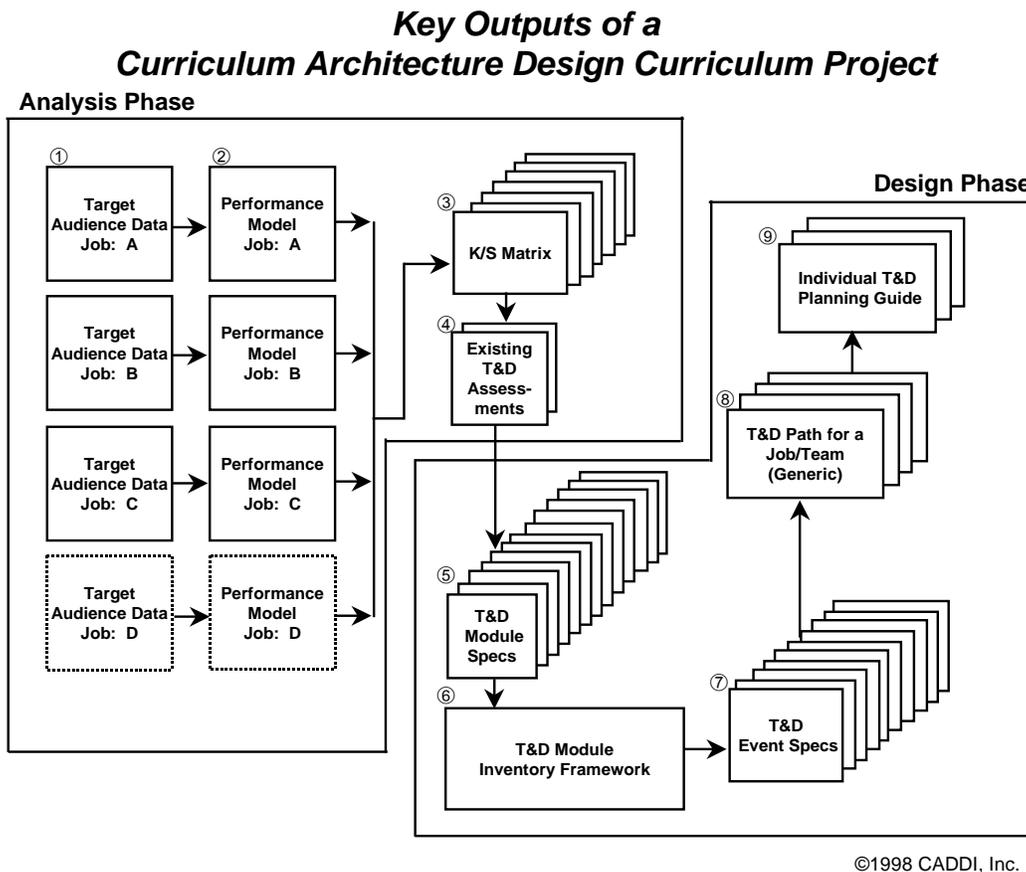
being maintained, inadvertently perhaps, but still certainly. This systematic approach to the modularization of training content will reduce maintenance costs.

The CAD's macrolevel analysis and design outputs become guiding MCD inputs to the midlevel analysis and design efforts, and they are further leveraged in the IAD's microlevel analysis and design activities.

A CAD identifies all of the T&D that *could be* in Phase 3.

In Phase 4, CAD prioritizes all of the T&D that *should be*.

The following graphic presents the key outputs of a CAD project.

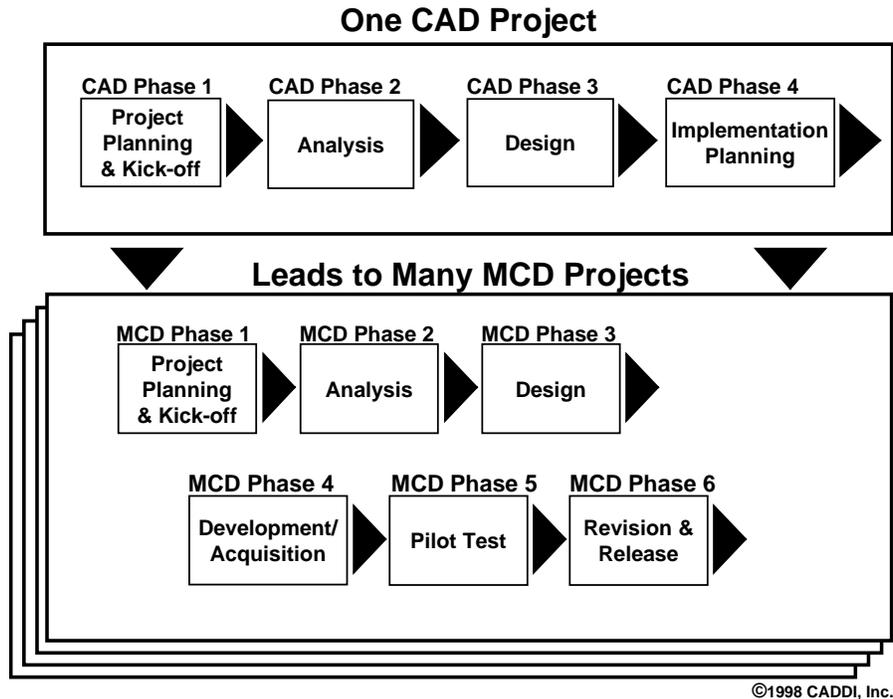


CAD projects typically span a two- or three-month cycle, but small CAD projects can be conducted in as little as five days *without* formal documentation.

We have used this methodology to help a pharmaceutical company develop 90 days of technology transfer training for their proprietary processes after two days in analysis and two days in design.

Although the analysis and design data was very macrolevel, it guided the development efforts. The end results were very close to all initial estimates for both development time and deployment time. This project was also a hybrid effort of both the CAD and MCD processes. CADs almost always lead to multiple MCD projects, where there is a clear key business priorities. Many potential T&D products

are never built because the ROI and EVA figures or the strategic value to the enterprise do not warrant the efforts and expenditures.



Just because T&D professionals are skilled at uncovering T&D requirements does not in and of itself warrant meeting those needs.

The PACT Processes can save the organization from low-value T&D and steer the resources to T&D with strategic, business-critical, high-payoff implications. And it can do it without overly complex ROI algorithms.

A number of methodologies are used throughout the CAD project; however, the most critical from both a quality and cycle time standpoint is the use of teams throughout all phases.

The use of appropriate company personnel on the designated project teams will ensure higher quality of both the project inputs and outputs. In addition, it will provide for a level of participation in the project activities that will create increased ownership of the results and more support for eventual implementation.

The project's overall structure for key roles and the teams is as follows:

- Project Steering Team
- Customer-side project manager
- Supplier-side project manager
- Analysis Team
- Design Team
- ISD Team

## ***CAD Phases***

### *CAD Phase 1: Project Planning & Kick-off*

In this phase, the project priorities, direction, and resources are defined. Potential issues and/or stakeholder requirements should be uncovered and planned for during this phase to ensure the success of remaining phases.

### *CAD Phase 2: Analysis*

The purpose of this phase is to establish a common view of the positions, personnel, performance requirements, and knowledge and skill requirements. In addition, demographic information about the target population and information about existing training will be gathered. This common view will form the basis for the CAD and all priority-setting activities later in the project.

### *CAD Phase 3: Design*

The purpose of this phase is to produce a CAD to address the performance tasks and knowledge and skills derived in the Analysis Phase. In this phase, tradeoffs may need to be made in order to maximize the return on investment for the overall corporation.

The intent is to create a CAD that is robust against future variation in job assignments; individual trainee experience, background, career goals; delivery facilities; and maintenance requirements. It also needs to be designed for content “updatability” and future adaptability to potential changes in the business (e.g., organization structure, competition, technology, etc.).

### *CAD Phase 4: Implementation Planning*

In this phase, the priorities will be established by the Project Steering Team for all of the T&D Events (and T&D Modules) and will be translated into a CAD implementation “development/acquisition plan.” The plan could include deployment planning and other T&D systems and infrastructure requirements, depending on the situation within the T&D organization and/or the enterprise.

## ***CAD Benefits***

Quality, performance-based T&D exists exclusively to improve human performance, and that human performance exists within the context of business or organizational processes. Any other goal for T&D has almost zero ROI.

The CAD’s architectural design will help reduce the life cycle costs of the entire training and development product line.

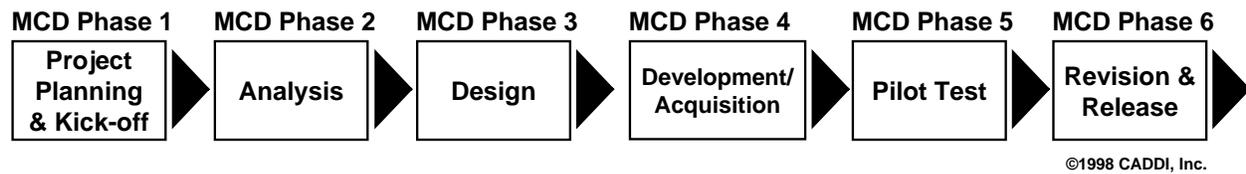
The T&D Modules can be configured many ways, but if they follow the “rules of modularity,” they will maximize the shareability of T&D content across various potential target audiences. They will create and/or reinforce common language across more target audiences, while also reducing the T&D suppliers’ costs by reusing content chunks over and over again (but only as appropriate!). Elsewhere in business, especially in design engineering, this is known as *configuration control* or *platform design*.

## ***MCD – Modular Curriculum Development***

This methodology provides another structured, gated, in-control process for the fairly quick design, development, pilot testing, and revision/release of the T&D Modules and T&D Events of the CAD.

CADDI uses a proprietary process that is designed to incorporate representatives from stakeholder groups into the overall project's activities and tasks.

An MCD project is conducted in six phases using a team process. The following model shows an overview of the CADDI PACT Process.



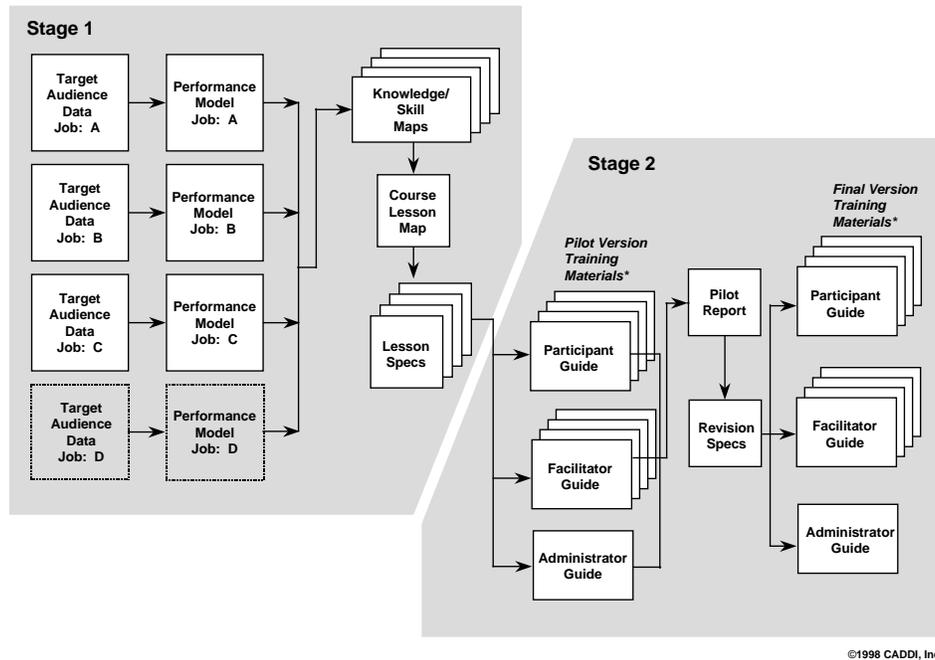
CADDI's PACT Process allows the various concerns of management, job incumbents, and staff support groups to influence the design decisions. The project will be controlled by a Project Steering Team that will make the final decisions. Teams of top performers will be used to identify both the performance requirements and the associated knowledge/skills required. Additional teams will be used in the MCD process to ensure that all decisions reflect the needs/issues of the company.

The six-phase structure above provides the framework for the project activities, deliverables, and team structure.

MCD projects typically span a four- or six-month cycle, but small MCD projects can be conducted in much less time. We built and pilot tested, in a 90-day cycle, a four-day "labor relations" course with more than 50 percent of class time in spent in intense simulation exercises/role plays. Three ISD'ers were involved.

The CAD outputs of the performance modeling and knowledge/skill analysis process and the CAD design specifications are used within the MCD process to drive the design to ensure it results in shareable T&D Modules and Events.

Key outputs from CADDI's PACT Process for MCD are shown below.



*\*Varies depending on the T&D deployment platform*

The project's overall structure for key roles and the teams is as follows:

- ❑ Project Steering Team
- ❑ Customer-side and supplier-side project manager
- ❑ Development Team
- ❑ Pilot-test participants
- ❑ Pilot-test instructors/administrators
- ❑ ISD/T&D Team

## ***MCD Phases***

### *Phase 1: Project Planning & Kick-off*

Project priorities, direction, and resources are defined; potential issues and/or stakeholder requirements should be uncovered and planned for during this phase to ensure the success of remaining phases.

### *MCD Phase 2: Analysis*

A common view of the personnel, performance requirements, knowledge and skill requirements, and appropriateness and completeness of any existing T&D is established; this common view will form the basis for the training design.

### *MCD Phase 3: Design*

In this phase, the Design Team is facilitated through a systematic design process; some details are completed after the design meeting.

Note: The intent of the team approach to design is not “to design by committee” but to influence “the designers by committee” during the actual design activities.

#### *MCD Phase 4: Development/Acquisition*

In this phase, the training is developed and/or acquired/modified per the Design Document (produced in Phase 3).

#### *MCD Phase 5: Pilot Test*

In this phase, the training is delivered (pilot tested), and extensive evaluations are conducted.

#### *MCD Phase 6: Revision & Release*

In this phase, all materials are updated (per the “revision specifications” from Phase 5) and are released into the training system.

### ***MCD Summary***

The PACT Process for MCD is a powerful process, if populated with the right people to do the right things at the right times. The gates ensure that our customers and key stakeholders for our T&D product line are systematically engaged for our collective success—collaborative win-win.

MCD uses the multiteam approach to plan and conduct a predictable project to develop and test performance-based T&D. Whether preceded by a CAD or not, MCD takes a proactive approach, with tools and templates to accelerate and ensure the quality of both the analysis and design efforts.

The MCD methodology engages the right stakeholders at the right time for getting the right inputs and right decisions at the right time. It shortens the project time cycle and reduces costs for T&D projects. It increases the quality of the T&D product/service by focusing on desired performance as the terminal learning objectives. It structures T&D content into more shareable chunks, thereby reducing future costs.

The MCD methodology provides a *gated* process for working with all project participants in an accelerated manner to produce performance-based T&D. The T&D professionals retain control of T&D decisions, and the stakeholders in your marketplace gain control of all the business decisions inherent in T&D projects and resourcing.

### ***IAD – Instructional Activity Development***

This methodology follows the same 6 phase approach as an MCD effort. It provides another structured, gated, in-control process for the quick design and development of various types of instructional components, including

- ❑ Knowledge Tests
- ❑ Performance Tests
- ❑ Simulation Exercises
- ❑ Performance/Job Aids
- ❑ Electronic (or Paper) Desk Procedures

- Instructional Content: awareness or knowledge level

This methodology produces things that could be part of a T&D solution, or could exist on their own. Our intent is to be able to build T&D components and wrap other T&D components around them later, as needs dictate/allow.

### ***My Start in performance-based ISD at Wickes Lumber***

It all started for me in 1979 when I entered the T&D field for Wickes Lumber in Saginaw Michigan and was immediately introduced to the work of Rummler, Gilbert, Mager, and then Harless. It started due to ISPI...then NSPI. My management and co-workers were from the NSPI crowd and were all Rummler-ites. The first thing given to me to read was Bob Mager's "Analyzing Performance Problems" and I bought six copies for several college friends scattered post graduation. I had to let them know what I had fallen into and found. This makes sense!

I worked on projects applying a Rummler-like performance analysis approach as a front end to the design and development of self-paced (paper-based and video-based) T&D for Contractor Sales, and then Inside Sales, and then Inventory Management. It is where I applied my Radio-TV-Film degree and started climbing the learning curve of ISD and HPT. I attended the 1980 NSPI conference in Dallas and saw live all the big names...Rummler, Mager, Harless, Brethower, Lineberry, Booth, Gilbert, and many others. Oh yeah. This is cool. Circumstances then took me back to sweet home Chicago.

### ***Next at Motorola and the Quality Movement***

In 1981 I started working at Motorola's Training & Education Center (MTEC), the predecessor organization to Motorola University. Our leader, Bill Wiggenhorn, had us attempt a project to create a Geary Rummler Design Process. That process would help us produce performance improving T&D as well as help the organization deal with those issues in the work processes that would not be affected by our T&D. The project became entangled in the 13 perspectives on "how I like to do it" and it didn't happen while I was there. Later, Jeff Oberlin, the Design Manager, did develop a methodology, but the Rummler-esq. version I had craved didn't materialize during my time there. Since then, it has always been my goal to do just that.

Our effort at MTEC failed. Too many cooks and not enough decisions imposed and the team drifted and fought. But it was a great idea. My time at MTEC was very good for me, especially working for Bill Wiggenhorn. His vision inspired all who worked with him.

We were into Rummler approaches to T&D and performance improvement, as well as Neil Rackham's Huthwaite SPIN selling models, and the growing quality movement including Deming and Juran and Dewey, and many, many others.

When I heard Deming say, "80% of all quality problems are in the control of management" I smiled. We at ISPI knew that for a fact. We know it is not always the performer. We know that it's not always the performer's need for training that is the root of any performance issue. I've heard Geary Rummler say it many times, "Put a good performer in a bad environment, and the environment wins every time."

I left MTEC in the middle of two projects involving Geary Rummler. They were my projects and he was my hired gun. Bill Wiggenhorn had previously brought Geary in for a day to speak to his new staff when

he himself began at Motorola in 1981. He had worked for Geary back at Xerox and wanted Geary to inspire us.

It was great for me. I even showed up for it two weeks before I took the job. Drove in from Saginaw Michigan to Schaumburg Illinois for the occasion. Wouldn't have missed it. Had seen Dr. Rummeler at the 1980 NSPI conference in Dallas and had found my inspiration. This job at MTEC was too good to be true. I was seeing the master at work. His sidekick at the time was Carol Panza and I learned a lot from her too.

At Motorola I worked on several interesting and enlightening projects. "The Legal Aspects of Purchasing " with done with Joe Hemrick's local T&D firm.

Then it was "Negotiations Training" was targeted for Motorola sales, purchasing and program managers got me exposed to Huthwaite of the SPIN sales model fame. But in this application we used another application of their behavioral model...applied to win-win negotiations.

I also worked on the "ABC's of Supervision" which became basic knowledge and skills training in SPC and other quality improvement tools and methods. It was quite an education.

### ***15 Years at R. A. Svenson & Associates and SWI - Svenson & Wallace Inc.***

When I joined Ray Svenson in 1982, I began to look at T&D as more than a partial family of curricula for a job or job family. I began to look at it more holistically. We studied jobs and created end-to-end paths of curricula to create performance competence. It was here that I began formalizing what became PACT.

My first Curriculum Architecture Design project was done here, in 1982. A combination of the approach Ray Svenson had for curriculum architecture from The Bell System for Technical Education (BSTE of AT&T), with a Rummeler-esq. Performance Model and Knowledge/Skill analysis to drive the performance orientation into the design of the modules of content.

Over my 15 years at what evolved into SWI (Svenson & Wallace, Inc.) and then into CADDI, I evolved the CAD methodology into a 4 phase process, with tools and templates and standards. Next I added a T&D module development methodology which is now MCD - Modular Curriculum Development. MCD picks up where the system engineering of the CAD approach leaves off. The high priority "gaps" of the CAD are addressed in subsequent MCD projects using an ADDIE-like 6 phases. Again, task procedures, tools and templates guide and streamline the process without shortcutting the real meat of ISD.

### ***At CADDI - The Curriculum Architecture Design & Development Institute, Inc.***

My most recent Curriculum Architecture Design project, number 70, was done here, in 2000. In the late winter of 2000 I published my book: lean-ISD. I was happy with the marketing quotes provided by some people I really respected.

Lean-ISD embodies a collection many best practices from many business disciplines. The current, leading ISD concepts, models, methods and tools included are intended to create an engineering practice of ISD.

Why? Because...after all my years in the T&D business, my view of ISD was still a muddled mess. All the books and articles I read , and the workshops and presentations that I attended at ISPI, ASTD,

Lakewood and other conferences, did not add clarity. Did not proscribe, which is exactly what the neophyte thirsts for. At least I did. Maybe today it is different. I think not.

### ***lean-ISD Summary***

The ultimate goal of the T&D is *improved performance* by the *learners*. That is how T&D product quality is best measured. The ISD process goals are to create this quality T&D in a reduced cycle time and at reduced costs.

We believe in performance-based T&D, but only when the ROI and EVA are sufficient to warrant the investment. Otherwise...don't bother. Our team and management approach facilitate the "for the sake of the business" only, no-nonsense nature of PACT projects.

Over the past dozen years, CADDI has attempted to *reduce to practice* many of the prevailing ISD concepts, philosophies, methods, processes, and practices. Our efforts have resulted in what we call the PACT Processes for T&D. Much of our ISD insight came from our affiliation with ISPI. For that we are very thankful. We hope you are thankful for our attempts to share over the years as well. Thanks for your interest.

This article was intended to overview what the PACT Processes are as an example of what lean-ISD is. This article is also intended to thank all those responsible for our opportunities to learn. And provide the history John asked for.

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