



# Designing for the ISD Life Cycle

by Guy W. Wallace, Peter R. Hybert, Kelly R. Smith, and Brian D. Blecke

In the April 2000 issue, *Training Magazine* raised complaints about instructional systems design (ISD) to a new level of our consciousness. They outlined the complaints:

- **ISD is too slow and clumsy to meet today's training challenges.**

Yes, ISD's pace is glacial in an Internet world demanding speed and adapting to constant change. Statements such as "the analysis itself will take a month and a half" make our clients and critics lose patience. But ISD can move quickly, deliberately, and systematically. Our approach is very visible, predictable, repeatable, and systematic. It is "lean."

- **There's no "there" in ISD.**

This questions whether there is an instructional "technology" for training in the first place. Too often people have learned from "stuff" that was created in processes that didn't follow the ISD-ADDIE model. We disagree.

- **Used as directed, ISD produces bad solutions.**

Yes, too often ISD begins without a business purpose in mind, and therefore can be applied poorly. Or it over-reacts to a fad, such as designing for "learning styles" (a concept easy to like but thoroughly debunked by actual research), resulting in wasted effort and time. Or it breaks the learning process into ridiculously tiny increments and forces unnecessary exercises and assessments.

- **It clings to the wrong world view.**

*Training Magazine's* article suggests that ISD arrogantly assumes a "stupid learner" who needs constant handholding to learn anything, and instruction designed to the lowest common denominator. But that's if the "product" was intended to teach to the lowest common denominator, either because that's where the bulk of the learners were and/or the enterprise simply couldn't afford multiple versions, or the ISDer didn't know how to chunk it and create multiple entry points in the learning process, or the deployment method wouldn't allow for that.

While we disagree with most of these blanket statements, we know there is some truth in these complaints for many of the ISD approaches we've seen in action, or seen in the results thereof. Those complaints in "the ATTACK on ISD" resonated with us too, because we've heard them before.

Other similar issues brought to our collective attention by meaningful ISD customers over the years include the following:

- Content of the product line elements (courses, computer-based training, on-the-job programs, etc.) may be redundant across programs while still leaving critical gaps in other important content.
- T&D is costly to produce in the first place, and even more costly to maintain.
- T&D 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.

Again, we agree with much of what's been generalized about the majority of ISD methods. But this attack on ISD presumes that there is only one ISD model being used. That is an incorrect assumption. In a department of 10 ISDers, we too often have encountered 10 *different* ISD approaches in use. These varied ISD approaches are typically not predictable in terms of the quality of the T&D outputs produced, or their costs and schedules, and they are not *in control*. The processes for T&D are often not very visible for either management or customers.

## Additional Complaints About ISD

Too often the typical complaints outlined above are only scratching the surface of the really big issues (problems/opportunities) that ISDers, our functions, and our enterprises face. We, and others, see those bigger issues as follows.

### Blanketing Versus Targeting ISD efforts

Too often the focus is on providing T&D opportunities for everyone. ISD efforts and resources are often wasted on low-value projects, with little chance for significant return on investment for the shareholders.

### Performance Impact

Performance is often understood in the most generic terms, perhaps driven by a generic competency model. Generic models cause ISDers to create generic products, with little chance at real impact back on the job. Communications, presentation, or problemsolving skills apply very differently for shop floor workers, their bosses, the sales force, the process engineers, the ISDers, and the company lawyers and accountants. One-size-fits-all products don't have much impact compared to targeted content (with perhaps some shareable components/objects). The costs of lost opportunity, of not really impacting on-the-job performance because the content and design did not focus ultimately on someone's real job performance requirements, can be significant.

### Reuse of Content

Too often instructional content is not designed to increase sharing where appropriate, and for nonsharing when unique content is needed. Even in multiple targeted communications skills training products for varied audiences there is common content. The costs for not improving reuse capability can result in significant additional costs to the enterprise. Imagine if your car did not share any components with other cars built by your manufacturer; the cost to produce your car would be significantly higher.

### Development

The costs for developing are artificially high because of a lack of available, standard but flexible rules, tools, and templates, or because of a reluctance to use them or to employ a rationale reuse strategy and approach. The end result can be redundant content that will cause higher "first costs" than necessary and will lead to higher "life-cycle costs."

### Inventory

The costs of storing and retrieving content are too high because of a lack of a rational system for products and their subassemblies, much like the bar coding SKU (stock keeping unit) schemes in place everywhere in our daily personal lives. If content exists within your current product line, can anyone find it quickly for reuse or maintenance?

### Administration

The costs are too high for communications/marketing, registration, scheduling (for those T&D products needing to be scheduled), or ordering (for those T&D products that need to be ordered) because the product line of T&D for any target audience is overlapped, gapped, and a mess in general and hard to present as a unified system of instruction.

### Deployment

The costs to deploy the T&D are often too high given the probable returns. When the cheaper, total e-learning strategy failed to produce results for many buyers, we now find ourselves back to a more blended approach that too often focuses on low-hanging fruit content that still won't move performance levels higher at an adequate return on investment.

### Maintenance

The decentralized ISD systems and processes that typically exist, including the lack of design rules and tools and the lack of a rational inventory scheme, will drive up the costs for keeping content up to date. But if the content isn't improving performance anyway, maybe it's better left hidden with the hope that any subsequent effort may get luckier, just don't share that with the shareholders.

## Impact on Life-Cycle Costs

The issues described above greatly impact the “life-cycle costs” for ISD products: T&D/learning products/knowledge products (which we will refer to as T&D).

While there are many IT tools in the marketplace today to address some of these ISD issues [such as Learning Management Systems (LMS), Content Management Systems (CMS), and Learning Content Management Systems (LCMS)], they are too often “open data warehouses” for data that you can configure anyway you want to. Again, this permits wide variation and can ultimately destroy projected return on investment.

“Having it your way” for each ISDer with a unique approach to ISD keeps the barn door open and the horses running free. The engineering community addressed this decades ago and closed the barn door with computer aided design/computer aided manufacturing systems. Additionally, standard parts inventories, design rules, and other tools and templates helped them speed design and ensure greater quality of those designs.

Life-cycle costs include “first costs.” T&D first costs include those costs incurred for developing T&D. All costs include the incremental costs incurred for having done something and take away from the profit on the bottom line. “Build it and they will come” comes at a cost.

Life-cycle costs include the costs for administering, deploying, and maintaining T&D. These can be significant. And if your up-front ISD processes allowed you to inadvertently build redundant content, then the life-cycle costs multiply even faster and deplete the bottom line greater. Remember, a dollar not spent falls directly to the bottom line.

Total life-cycle costs include “all costs” paid for with shareholder equity that are incurred both inside the T&D organization and outside the T&D organization for doing “something” T&D-wise. There is the overhead covering the costs for buildings and facilities, utilities, furniture, equipment, phones, and so on. And on top of that there are the T&D management layers to pay for.

Then there are the outside-T&D costs: T&D participants’ and their management time, time spent in development, deployment, administration, and maintenance, as well as their benefits, and all the costs of their management for when they are not doing the jobs that they are on the payroll to perform. There are their costs for planning T&D to meet their performance-related needs, registration and ordering, participation via classroom T&D and/or via the Intranet.

## What Is Our Approach to ISD?

Our ISD methodology set is labeled The PACT Processes for T&D<sup>sm</sup>, which we see as a *lean*-ISD approach.

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 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 testing, and evaluation.

These *lean*-ISD processes allow for the following steps:

- Dividing the ISD project efforts across multiple T&D organizations, locations, and personnel while ensuring that all the T&D pieces will fit together for a *seamless* experience for the learners (and for “back office” management)
- Planning and managing predictable projects with predictable schedules and resource consumption (peoples’ time and out-of-pocket costs)
- Developing 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
- Reusing (with little or no customization required) the T&D products and subassemblies for various target audiences from across the organization
- Involving and collaborating with both upstream suppliers and downstream customers

Our PACT Processes for T&D operates at three levels of design, much as many engineering design methods operate for any “engineered product.” We see T&D, learning (“e” or otherwise), and knowledge products for knowledge management systems as “engineered products.”

What’s an engineered product in the more sophisticated engineering enterprises today? It is one that is designed to meet the customers’ functional requirements and uses and meet or exceed customer expectations, is robust to use and misuse (within limits), and is designed for lowering the total costs to produce over its entire life cycle. It is designed for the Xs in the life cycle. What are the Xs the life cycle? They include—

- Performance impact
- Manufacturability
- Reuse
- Inventory
- Administration

- Maintenance
- Discontinuance
- “Total” return on investment and total economic value added

The value for designing for the Xs includes the following:

- Improved instructional relevance and job performance
- Reduced cycle times and costs to produce instruction
- Increased “common-ization” of communications, language, models, culture, etc.
- Reduced cycle times and costs to administer, maintain and manage the instructional products, subassemblies, and components (instructional objects)
- Increased shareholder value due to improved “total” return on investment and total economic value added

What is a nonengineered product? It is a “one-off” product design where the designer was not concerned with any or many of the Xs. It is more of an artistic effort than an engineered effort. Is it always inappropriate? No. Think of Chia pets, pet rocks, and fad-du-jour. Think of some (not all) corporate communications, and local, short-term/low-impact issues. Think of fun stuff. Silly stuff. But don’t apply this artistic, one-off approach to critical enterprise needs. Not

where health, safety, or the future viability of the enterprise and employees are concerned.

Our PACT processes for T&D are for serious needs, not one-off communications. That would be overkill in the extreme. When appropriate, we apply the three levels of our engineering process for ISD, the three levels of PACT:

- Curriculum Architecture Design—the rough equivalent of systems/architectural design
- Modular Curriculum Development—the rough equivalent of product design
- Instructional Activity Development—the rough equivalent of component design

Not all three levels are used in every ISD endeavor.

Systems/architectural design is where the entire product line is designed (based on appropriate analysis) to work as a system. At this level the product line is optimized and critical trade-off decisions are made. Segmenting the system into pieces is but one end goal among many for the systems engineer, segmenting it so that it lowers costs over the entire life cycle. Sometimes you need to actually invest more for your first costs to lower total life cycle costs. Systems design of a campus works this way; so does the overall design for the entire “product line” for an auto manufacturer, for a software applications suite, and for a set of curricula for electrical engineers.

Product design is where a product, a subset of the system targeted for its predicted value or return, is designed to work as a component of the system. Product design of a building works this way, so does the design of an automobile, a word processing program, and an engineering course on radio frequency.

Component design is where the subassemblies of the product are designed. Component design of a classroom works this way; so does the design of an automobile engine, or the copy and paste function, and for the overview of systems and products where radio frequency engineering techniques are applied.

#### Results Achieved in Client Projects

In one telecom effort it took less than six months to redesign 380 days of T&D down to 187 with a very visible performance orientation that increased client support, which resulted in their participation in the development and deployment. The T&D now seemed relevant.

In an automotive engineering organization the redesign of two jobs into three jobs led to a forecasted return on investment of 360:1. For a \$500,000 investment cost, the return was \$180 million.

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## Implications for the ISD Professional, the ISD Function, and the Enterprise

What if you wanted to embrace a more structured, data-driven, team-based, collaborative set of performance-based ISD methods? What are the implications?

For the ISD professional it means not being a complete “artist” using your own special brand of ISD and your own set of personal preferences for look, feel, sequence, and the ability to do the next project differently than the last effort, to keep yourself amused/stimulated/fresh or just feeling good about being the creator of the *objet d’art*.

This was something design engineers had to adjust to in many engineering companies. It’s been done. That doesn’t make it easy, just easier with the “lessons learned from being burned.”

It means enterprise and ISD leadership must provide all of the enabling processes and assets to make this hum like the shops in the best-in-class manufacturing world. That doesn’t happen by chance; it happens by design.

For the enterprise it means being data driven, systems and process oriented, and putting the asset resources in place to get the critical things done. It stops the squeakiest wheels from hogging the grease, and ensures that you are targeting critical programs and projects and deploying resources to achieve the strategic intent. 🍷

## References

Gordon, J., & Zemke, R. (2000). The attack on ISD. *Training*, 37, 43-53.

Wallace, G.W. (2000). *lean-ISD*. Naperville IL: CADDI Press.

Womack, J.P., Jones, D.T., & Roos, D. (1990). *The machine that changed the world*. New York: HarperCollins.

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In his most recent role prior to joining CADDI in 2000, he was a vice president of training and development, where he employed CADDI’s PACT Processes for T&D to create curriculum architectures for more than 2,200 people in 17 jobs and 9 training and development products.

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