1 – WHAT IS CURRICULUM ARCHITECTURE DESIGN – CAD?

Chapter Overview

This chapter is intended to provide you with an introduction to this book, and to Curriculum Architecture Design – as both a Product and as a Process.

This first chapter will provide you with an overview to everything CAD – Curriculum Architecture Design - before diving into the details in succeeding chapters.

Book Overview

This book will provide you with both an overview of Curriculum Architecture Design, and the details – enabling you to begin to conduct Curriculum Architecture Design efforts – assuming you have the facilitation skills necessary to conduct the Group Processes for analysis and design efforts.

Bottom line: the Curriculum Architecture Design process identifies all of the L&D - Learning & Development that could be and then prioritizes efforts to build/acquire all of the priority gap L&D that should be. Post-CAD resourcing by the Customers and Stakeholders insures what L&D actually will be.

I do not subscribe to the notion that just because an Instructional Designer can identify a valid learning need that the Enterprise should resource that need. Only ROI and other similar business metrics should drive that decision making.

There is a big focus here in these CAD methods on collaboration with the Customers and Stakeholders of ISD efforts to insure that sound business decision making drives Instructional Systems Design decision making.

Note that a CAD effort does not produce any new L&D content. That happens post-CAD as appropriate, and as decided in business decision making, not Instructional Design decision making.
And a CAD effort should be done for only the critical “PUSH” jobs in an Enterprise. The content specified and developed/ acquired for those critical audiences can also be shared with other, less-critical “PULL” audiences – and although not as authentic as perhaps needed to be truly effective – were not critical to serve in the first place.

In this book I will describe the benefits to the Instructional Systems Design Customers, the ISD Suppliers and to the Enterprise in general for beginning their ISD efforts in this manner, in chapters 2, 3 and 4 respectively.

I will cover the Curriculum Architecture Design products produced, and the processes used to produce those outputs in chapter 5.

I will detail the 4 phases of a CAD effort – phases that you can combine into one, two or three if necessary – in chapters 6, 7, 8 and 9 respectively.

I will describe the infrastructure and other environmental enablers required to support the conduct of this set of methodologies in chapter 10.

I will describe the teams and their roles, their tasks and their members’ selection criteria in chapters 11 and 12.

I will cover the key knowledge and skills needed by the CAD Practitioners, the ISD staff, in conducting CAD efforts in chapter 13, especially the facilitation skills required of the Group Process approach.

I will present several other uses for the analysis data produced, such as focusing recruiting and selection systems on performance competence requirements, or populating an ERP (Enterprise Resource Planning) system with valid data about Process Performance, in chapter 14.

If this is seemingly important to you in your performance context – then this book is for you!

On to an overview and background about CAD – Curriculum Architecture Design.

**CAD Overview**

Curriculum Architecture Design – CAD – is one of 3 levels of Instructional Systems Design – ISD in my PACT Processes for Training & Development, Learning and Knowledge Management.

Curriculum Architecture Design sits at the top of the 3 levels of design, with Course development in the middle, and Course component development at the bottom; much as your home was architected, then built/developed, and used modular components not built from scratch but created and shared with other houses, apartments, etc.

These three levels of Design are driven by the common Analysis data, which is focused on the Performance Competence Requirements of a Target Audience or Audiences.
And all three levels of Design use a set of common Project Planning and Management concepts, models, methods, tools and techniques.

CAD as one of those three levels of Design focuses on the analysis and design of T&D Paths, or Menus of Training & Development, Learning and Knowledge Management content: including both Instruction and Information.

In order to avoid repeating the phrase “Training & Development, Learning and Knowledge Management” I will simply refer to it all as “L&D” – meaning Learning & Development – or “T&D” meaning Training & Development.

Both are terms which are interchangeable – and are inclusive of all blends of media and modes of Instruction – but in our case here are focused on known outcomes, known terminal objectives, known or discoverable, via the CAD analysis methods, of the Performance Competence Requirements.

I have typically, historically have referred to what is now called here in this book as either as L&D or T&D – as T&D, and many of the graphics here use that T&D label.

Please adapt for your uses as needed. The terms are equivalent – at least to me they are. And I will slip into my old patterns and use T&D in this book on occasion. Bottom line for me: it’s all about the terminal learning goals directly related to the terminal performance goals of Performance Competence.

And I define Performance Competence as: the ability to Performa Tasks to Produce Outputs to Stakeholder Requirements.
And I define **Stakeholders** as more than just the Customers, and in this case are more than just the targeted Learners and their Management.

While Customers may lead the definition of Requirements – they are not the King of Stakeholders – their needs and desires, their demands, do not rule the business decision making involved in ISD.

As you can see from the illustrative Stakeholder Hierarchy above – there are other Stakeholders whose needs and desires actually outweigh the Customer…each and every time there is a conflict!

**The Learning Context for CAD**
The performance-based approach presented in this book is intended for an **Enterprise** Learning Context, as opposed to an **Educational** Learning Context or a **Personal** Learning Context.
In an Enterprise Learning Context the terminal goals of learning are exactly the terminal goals of performance – what I have termed Performance Competence – which are actually easy to define most of the time - and which we overviewed earlier. In these other two Learning Contexts that direct linkage is not always the case, nor are those contexts as easy to define, because the decisions are more arbitrary.

**CAD as a Product**

Curriculum Architecture Design produces several Products, some for the ISD Customers and some for the ISD Suppliers. It also produces something for other Enterprise Stakeholders as well.

Here is a graphic that portrays the outputs, per phase, of a CAD effort.

Some of these CAD outputs are more appreciated by the ISD Customer than others – and all are needed by the ISD Suppliers.

**For the Customer**

What the Customers get from a Curriculum Architecture Design effort includes an **L&D Path** – which is a marketing poster for the L&D that one might need, and identifies what is Mandatory, what is Highly Recommended and what is an Elective.

They also get an Individual Planning Guide plus the analysis data that informed the designs of these first two products.

**L&D Path**

An L&D Path, also known as a T&D Path or by other labels, lays out a suggested sequence of development, using any blend of media and mode as appropriate to the Learners, their management and the Enterprise
itself. It should not call out modes of Instruction or deployment that don’t exist or are otherwise not feasible or practical.

E-learning for underwater welders for their use during the moment of need is not practical for a number of reasons. Perhaps for their support team, but that’s another Target Audience.

L&D Paths should be: as rigid as required and as flexible as feasible.

Some Paths are very rigid where everybody is expected to take everything – often in lock-step. And other Paths are open menus where the Learner – or their management – are in complete control of what will be taken.

Here is an example of a flexible Path – except for the Mandatory Events on this Path.

L&D Individual Planning Guides
The Curriculum Architecture Design also produces the information need to produce a paper or electronic L&D Individual Planning Guide.
This enables Learners and their management to “down-select” from everything on the Path and plan and schedule its completion to meet the specific needs of the Performance Competence Requirements of that Learner – given the specifics of their job assignment and their incoming knowledge/skills.

Here is the top row from that planning guide.

<table>
<thead>
<tr>
<th>T&amp;D Event #</th>
<th>T&amp;D Event Description</th>
<th>Delivery Method</th>
<th>Length</th>
<th>Recommendation</th>
<th>Your Need</th>
<th>Target Date for Completion</th>
<th>Actual Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1021-01</td>
<td>Senior Managers</td>
<td>C</td>
<td>2 hours</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: M is for Mandatory – in the graphic above.

**Other Data Products**

Plus the Customer gets to use the Analysis data for other needs.

The key Analysis data include:

- Target Audience data
- Performance Model data
- Enabling K/S data
- Existing T&D Assessment data

Some of this data has many additional uses, including providing content for Job Descriptions, Performance Appraisals, Pay Progression systems, and several others uses.

More on these other uses of the analysis data will be covered in chapter 14.

**For the Suppliers**

Curriculum Architecture Design effort produce things directly useful for the ISD suppliers, that aren’t necessarily seen as all that useful for the Customers. At least “not seen as useful” by most Customers.

The Suppliers of L&D find the Path and Planning Guides useful for their needs. But there are other outputs produced that are uniquely theirs.

Those outputs include the design “specifications” for content – at two levels:

- The Event level (a.k.a.: Course, Workshop, Session, etc.)
- The Module level (a.k.a.: Lesson or Learning Object, etc.)

This is a modular approach to Curricula design. Not a design approach for creating a collection of Modules. There is a big difference!
Note that I do not subscribe to the notion of reusable Learning Objects – for I believe that that is too big a package – as it is really a Lesson – like the tabs in the binders from back in the day. That leads too often to reuse of generic content, with perhaps some face validity at the title level, but often with content not authentic enough to truly impact learning and performance. Often, but not always.

Next is an example of an L&D Event Spec (labeled T&D versus L&D as this is an older example).

Note that this format calls out the Event’s Module contents – as if listing the chapters of it as if it were a book – which is a great analogy.

A CAD’s Path is just like a reading list of books, both those books that already exist, and those books that do not yet exist – but are now “planned for.”

The Event Spec is like a table of contents for any one book – books that do not exist yet. The gaps that “might be” attended to and addressed – or perhaps not.

Also there are Module Specs produced in the CAD effort – to be covered later – in chapter 8 – for those gap Modules of those gap Events that define the content of those Modules.

Those Modules, continuing the analogy, are the chapters of those gap books (the gap Events).
All of these “Specs” are used post-CAD effort to facilitate actual development of the priority gaps. Please recall that not all gaps are to be addressed, unless truly worthy from an ROI perspective.

In my view the R in ROI includes both the **Rewards** to be achieved, and/or the **Risks** to be avoided. Those affect business decisions as opposed to Instructional Systems Design decisions.

A Curriculum Architecture Design effort also produces a blueprint of all L&D Modules for tracking purposes. Next is an example of one page from the several from the project where this was developed.

These Modules – the chapters in the books of Events – are organized into a 5-Tier Enterprise Content Inventory framework – both visually and numerically – in a tracking system.

This 5-Tier Inventory framework is part of the infrastructure needed to enable post-CAD efforts – the MCD and IAD efforts: those two other levels of Design in the PACT Processes.

This 5-Tier Inventory scheme is intended to facilitate reuse for other CAD and MCD/IAD efforts – reuse either “as is” or “after modification” – as appropriate to the authenticity needs of those next Target Audiences.

I firmly believe that most generic content, such as Time Management or Active Listening, is less than worthless, as it is an additional, unnecessary cost, with a negative ROI, as the application of Time Management and Active Listening is somewhat unique, or very unique, from one Target Audience to another.
Research has shown that only about 15% of people can successfully learn “out of context” and apply what they learn in some other context – such as their own Performance Context (from Richard E. Clark, PhD in a phone conversation in 2007).

And those research findings more than suggest that “as is” isn’t the way to go for most generic sounding titles. It suggests that “after modification” is usually the best way to treat Time Management, Active Listening, and the hundreds of other titles of that “ready to buy right now” learning resources that you see in advertisements in your e and snail mail every week.

For the 5 Tier Inventory scheme think: drawers in a dresser: socks in this drawer, shirts in that drawer. Here is the 5-Tier Inventory structure or framework:

![Diagram of ECA 5-Tier Inventory](image)

Or think: aisles in a hardware store: wood products in this aisle here, and plumbing products in that aisle there.

This 5-Tier framework is just part of the picture of the overall PACT content inventory scheme. More will be covered on this in chapters 8 and 10.

**PACT Flexibility versus Rigidity**

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Note: Modules are a little tricky in the PACT Processes – for when an MCD effort follows a CAD effort – the flexible methodology enables the next Design Team effort to convert Modules to Lessons – and not necessarily one to one. Modules are “temporary things” in CAD; things that go away and become other things, Lessons, in MCD.

In MCD a Module from a CAD effort can be converted to more than one Lesson; or be combined with another Module into one Lesson. And Events might also be reconfigured post-CAD during an MCD effort – but that is rare.

The reasoning behind this is that in a CAD effort, just enough analysis and design is done to make business decisions about content – existing and gaps. It is not intended to prematurely lock into the eventual design specifics and configurations. Detailed design decisions are finalized in an MCD effort – not in the CAD effort.

More on this flexible inventory scheme and Modules becoming Lessons will be covered in chapters 8 and 10.

For the Enterprise Stakeholders
The Enterprise Stakeholders get a lot from a CAD effort.

They get sound business decision making that drives eventual sound ISD decision making. Both together will help increase the ROI for these types of investments – and avoid neutral or worse, negative ROI results from L&D development and acquisition expenditures.

The Curriculum Architecture Design methods produce more visibility for and engagement of the Enterprise Stakeholders – so that conscious business decisions about Investments in L&D are for Returns – whether they wish to carefully calculate those Returns for the Investment costs – or not.

Minimally the CAD processes identify the Investment cost possibilities and lets the Stakeholders decide. Sometimes the decision is, as they say, a no-brainer. And calculating the Returns are just not necessary – although they could be done.

Sometimes the Target Audience is performing in such critical processes that the costs-of-non-conformance (CoNC) – a quality concept and term – are so significant that the costs-of-conformance (CoC) are therefore so very insignificant – even if they are in the millions of dollars (using US currency) – that fooling around making these calculations of ROI estimates is not worthy of an executive’s time of day.

If what could happen if people are not competent likely includes missing a big sale, or closing down a facility, then calculating the R and the I for those Risks to be avoided, is again, sometimes a waste of time.

It’s often one of those “no-brainers” as they say. Especially if that potential Risk is something that has already been keeping many of the Enterprise executives awake at night.

And Another Thing
Chapter 1 of the 2011 book: Performance-based Curriculum Architecture Design

And as this CAD process deliberately looks for content to reuse – as is or after modification – it saves the Enterprise big bucks in side-stepping inadvertent cost redundancies – both first costs and the much larger life cycle costs of redundancy.

Those overlaps – as well as gaps – are unfortunately, the results of many Poor Practices, as opposed to Best Practices, being practiced in the field of ISD today. They result from:

- Rapid Design/Development approaches sans analysis
- Any effort that develops content as a one-off without a master plan, without it being seen as a piece of the puzzle that needs to actually fit the open space (so to speak)

Yes, there at times should be redundancy – by design – and not inadvertent – for reinforcement, refresher and even for remedial needs. But: By Design and not By Chance!

This will be covered in greater depth in chapter 4.

**CAD as a Process**

The Curriculum Architecture Design process is a phased process – but can be configured in many different manners.

The following graphic is my 4-phase approach – and note the upside-down traffic lights – not “stop lights” but “go-lights” that represent the Project Steering Team’s Gate Review Meetings – where “they” are in a hurry and wish to avoid analysis paralysis.

They like the “go light” versus “stop light” when I explain it to them – before or after they catch this quirk in my visuals.

As CAD efforts are typically targeted at critical Target Audiences only – and not for every position in an Enterprise – the clients are usually in a great hurry – and the intent is to conduct all project activities quickly and competently - and “get on with it.”

But while clients – Customers and Stakeholders – are in a hurry – they are most often wise-business-people who also know that haste can make waste.

If your clients seem impatient with you and your current methods – or even with first hearing about these methods – please keep in mind that they have probably been burned before and have learned that “us ISD’ers” can take a long time and produce stuff that doesn’t really work.
And so their impatience with analysis and wish to avoid it – or their outright forbidding it – is from their learnings from burnings.

It's just too true and reasonable for them to feel this way.

I recall vividly a client at Motorola, in 1981, telling me: I hate it when you guys come back 90 days later and tell us what we told you on day 1.

If that had been your experience – you'd rush past that worthless analysis phase and get on with content creation – and do the continuous improvements needed from there. That would seemingly be the smart thing to do – the Best Practice – from a wise, previously burned client’s perspective.

We did this to ourselves – so to speak. Hoisted on our own petard of Poor Practices.

So one of the big deal things that the Enterprise Stakeholders get from a CAD approach is: “the light from the dawn of a new day, and a new way, to get what they are after in the first place: Performance Competence for ROI for top priority Target Audiences.”

Those critical audiences those that I refer to as PUSH Target Audiences.

The Stakeholders also get content that can be shared “as is” and/or “after modification” for other priority audiences – further reducing their investments costs and thereby enhancing the ROI for those efforts.

And they even get content to use “as is” – even if not truly effective – due to that “only 15% can learn out of context and apply to another context” – for all other, non-critical Target Audiences – PULL Target Audiences - for use in touting “all the training you’ll get” in their recruiting efforts!

This will all be covered in greater detail in chapters 5, 6, 7, 8 and 9 respectively.

**CAD is 1 of 3 Levels of ISD**

Curriculum Architecture Design is one of three levels in my Instructional Systems Design methodologies. It is at the top in the following graphic.

CAD provides an architectural, or engineering approach to ISD, rather than an artistic approach of “whatever, whenever, however” – an artsy approach that is hard to then replicate efficiently for additional Target Audiences while having an actual positive impact on their Performance Competence.
The artistic approach to Instructional Design can sometimes seem to work – especially if the post-effort evaluations are focused singularly on smiles or happiness evaluations – and not on Mastery, or Transfer or the Results measured in ROI.

Not that you can’t be artistic with the engineering/ architectural framing of content – because you can! And one can be even more artistic in the creation of content later in MCD – where one develops the Information, Demonstrations and Applications content for each Lesson.

And one of the key aspects and benefits about CAD is that it sets the stage for content reuse as discussed earlier – but not at the traditional “learning object” level – and not with a “whatever, whenever, however” approach to content design, as that approach simply does not enable that potential reuse to any good affect from a business perspective – except for those recruiting efforts to tout what “we’ve got for you and your development!”

The three levels of ISD in the PACT Processes include:

- **CAD- Curriculum Architecture Design** – the modular design of performance-based instructional and informational content for performance competence development.

- **MCD- Modular Curriculum Development** – this is the PACT Process’ version of ADDIE: Analysis – Design – Development – Implementation – Evaluation – and is used to develop one or several sets of Instructional Content or Events. But MCD adds a Planning Phase before the Analysis effort.

- **IAD- Instructional Activity Development** – is also a PACT Process’ version of ADDIE: Analysis – Design – Development – Implementation – Evaluation – however this is used to develop one or several components of Instructional Content or Events, such as Knowledge Tests, Performance Tests, Case Studies, Demonstrations, Examples, etc. IAD also has a Planning Phase before the Analysis effort.
These three levels of ISD are enabled by common analysis methods and common Project Planning & Management concept, models, methods, tools and techniques.

Note that Modular Curriculum Development effort or an Instructional Activity Development effort can come before or after a CAD effort. That is by design.

One does not need to always conduct a CAD to develop any L&D. One could start with a key Event or two, or start a CAD effort with those already in place, and then do a CAD to complete the effort.

And a CAD is not just about “Formal Learning.”

Many of my designs, going back into the early 1980s used “Informal Learning” – but guided Informal Learning – as a means to the ends of developing Performance Competence to the requirements of the Processes that the Performers perform within.

**PACT Analysis**

There are four types of analysis that occur in a CAD effort:

- Target Audience
- Performance
- Enabling Knowledge/ Skill
- Existing L&D/T&D Assessments

These CAD Analysis outputs and the ISD methods to generate them are covered in greater detail in chapter 7.

**PACT Project Planning & Management**

Project Planning and Management is a key to success with most project efforts, and CAD is no exception.

Use of Customer and other key Stakeholder interviews is critical before planning. Use of a formal Project Steering Team and formal Gate Review Meetings to review and approve and resource the plan is also a key to ultimate success.

Of the CAD efforts that I have been on, over 70 thus far, almost all have succeeded when this was approached formally, and most of those that failed – unfortunately - have failed when they weren’t approached formal.

These project planning and management issues are covered in greater detail in chapters 6, 7, 8, and 9.

**PACT**

PACT is an acronym – see this next graphic.
The PACT Processes approach Enterprise Learning from the perspective of a shareholder or owner of the Enterprise. Check out the acronym again.

Oh – there’s that T&D label again. Convert T&D to L&D if you must! (PACL?)

PACT involves a pact – an agreement, between the ISD Suppliers and the ISD Customers.

And that PACT acronym includes “being driven” by the Customer and Stakeholders – not just collaborating with them. If we ISD-types cannot always make the business case for what we think we should do and when we should do it – perhaps we shouldn’t even try.

Investments elsewhere in an Enterprise are made only for significant returns. Why should T&D or L&D efforts be different?

Training, Learning and Knowledge Management efforts – that T&D or L&D stuff - should only be done for a business reason – not because they can be done – no matter how legitimate the uncovered need.

I firmly believe:

Just because an ISD practitioner can identify a valid learning need - does not in and of itself warrant meeting that need.
Only ROI projections based on valid estimates of Risks, Rewards, and Investment costs for the life cycle of the need should be the basis for meeting the need, or not.

I find this attitude and perspective awfully unique in my profession. And that is just not good stewardship of shareholder equity. If you have 100 valid needs and not enough resources to do them all – how will you make the decisions? By alphabetical order of the title, or the requestor name? First or last?

If you don’t believe this yourself – in L&D Investments for significant Returns, perhaps you should put this book down right now – as you are probably wasting your time.

Perhaps your context requires you to think differently about it. But in an Enterprise Learning Context I cannot imagine how or why.

Chapter Summary & Transition

This chapter was intended to overview Curriculum Architecture Design as both a Product (set) and as a Process (set) before diving into the details that follow in succeeding chapters.

CAD is for an Enterprise Learning Context
The Curriculum Architecture Design (CAD) process as presented here is intended for an Enterprise Learning Context and not for an Educational Learning Context or a Personal Learning Context. Although those can be done too, just not as easily as the decision as to “what to cover” are more arbitrary as there is no Performance Model to drive those decisions.

The Purpose of CAD
A CAD effort generates the overall design for an entire L&D product line of blended curricula of any media and mode. It can include both instruction and information of any nature. It can include content for “in the moment of need” and content for “prior to that moment of need” – or for both.

It’s only real requirement is that it enables Performance Competence: the ability to Perform Tasks, to Produce Outputs, to Stakeholder Requirements.

The CAD effort produces a T&D or an L&D Path (a.k.a.: Training Path or Learning Path), a T&D Individual Planning Guide, specifications for Events and Modules for all gaps, and a list of priorities and their estimated costs for addressing each and every content gap and maintenance need – so that business decisions can be made by the Customers and Stakeholders on the Project Steering Team.

CAD efforts then lead to Modular Curriculum Development or any other ADDIE-like methodology to produce or acquire the gap content and/or conduct the maintenance of any existing content requiring modification before use.

The design is high-level (macro-level), systems-oriented, and modular. The design identifies

- What (within the scope of the design) training needs exist
- What currently existing L&D that addresses the training needs as is
Bottom line: the Curriculum Architecture Design process identifies all of the L&D that could be and then prioritizes efforts to build all of the gap L&D that should be.

Again, the purpose of designing the entire L&D product line is so that business decisions can be made regarding which of the current gap L&D products (those where no existing training product addresses a training need) should be developed or acquired, and therefore will be.

The Curriculum Architecture Design process is the way to produce an organized structure of performance-based learning activities for a job or function. Based on the architecture, selected L&D can be developed or acquired using other PACT Processes such as Modular Curriculum Development or Instructional Activity Development.

The Curriculum Architecture Design, however, is where it all starts.

By developing or acquiring such products, the L&D organization brings them “to market,” making them available for L&D customers: Learners and their management.

The macro-level design of the L&D product line also helps identify which of the existing L&D products require maintenance, or modification before reuse for this Target Audience.

**Curriculum Architecture Design Outputs**

A Curriculum Architecture Design process leads to a number of analysis and design outputs.

The Project Planning outputs include a Project Plan. More on this in chapter 6.

Analysis outputs include Target Audience data, Performance Models, Knowledge/Skill Matrices, and assessments of existing L&D. More on this in chapter 7.

The Design outputs include specifications for training and development components, called L&D Modules. The outputs also include specifications for L&D Events, which are simply packages or groupings of Modules for use by L&D customers. More on this in chapter 8.

The Implementation Planning outputs include a list of gap and maintenance priorities and their estimated costs. CAD efforts lead to MCD and/or IAD efforts – both of which are the PACT Processes’ version of ADDIE. More on this in chapter 9.

This chapter flows logically into the next. However your needs may cause you to want to skip around.

The following are the chapters and page numbers for your personal navigation efforts.

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This book is available both as a paperback and a Kindle – and is part of a 6-Pack, which was an overall update of several of Guy’s book. Note that lean-ISD (1999) is available as a free PDF and as a paperback.

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