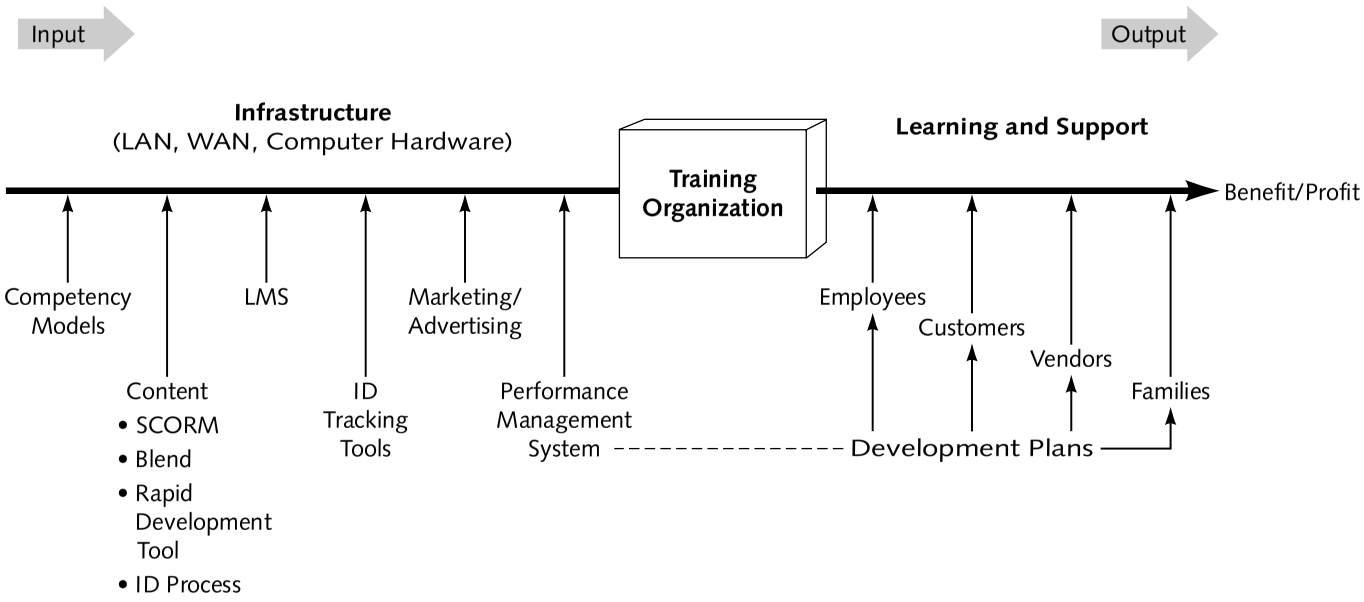
INTRODUCTION: GETTING THE MOST FROM THIS RESOURCE

WOW! So much has changed since the first edition of our book went to print in 2000 (which really means we began writing it in 1999)! Everything from changes in terminology to attempts to define consistent standards. *Learning management systems* (LMS) have proliferated since our first edition. These LMS have often incorporated *learning content management systems* (LCMS) to deliver learning activities and track them. And we have been learning too! We want to update those of you who purchased the first edition on how all of this has impacted the instructional design model.

Another unexpected surprise for us is that the first edition of the book has been translated into four languages: Korean, Japanese, and two Chinese dialects. "Thanks" from the authors to our international audience!

The major thing we have found that has not changed is how complicated the issue of e-learning is. As a matter of fact, it has become even more complicated. Figure I.1 graphically represents all of the components that need to be considered when implementing learning, including e-learning.

Figure I.1
Components of E-Learning Implementation



This book only deals with the learning components of this model. The inputs to implementing learning usually go through some training organization or learning function whether learning is delivered centrally, say through a corporate university, or if it is decentralized and distributed through numerous training functions within one organization. Many companies are creating new positions called *chief learning officers* (CLOs) to coordinate and implement this increasingly complex issue.

Trying to stay on the leading edge of technology is nearly impossible. But our continued involvement in the learning arena has brought many of the changes to our doorstep, and we have also gone looking to answer questions for our customers. So we thought it was time to update the book with what we have learned and to bring it more into line with our continually evolving philosophy.

When we began the first edition, the term for online learning was "multimedia." Now it's "e-learning." Multimedia now means what it always should have—"multiple media." That's how we always defined it. So we will continue using multimedia to refer to blended solutions (yet another relatively new term).

The emphasis is still very much on multimedia. Maybe even more than at any time before in the discipline of training and learning! Maybe to the extreme! We have seen many instances where "everything to the web" was the dictum. Unfortunately, most of those efforts were less than successful because insufficient thought was given to the process of translating everything in learning to one medium. Most of the edicts are for economic reasons only. While we believe that most of what can be learned can be learned through some electronic medium, given the advances in web technology, we still believe strongly that decisions should be made in a systematic manner based on what the needs are for technology-based solutions for training delivery and solving business issues.

The reason for the emphasis on multimedia is still much the same. In a global corporate environment that is increasingly becoming a virtual world whose people are connected by technology, the need for rapid communication, continuous information flow, and speed to market is critical. Maintaining the business construct of everyone in the same room at the same time is increasingly difficult and often implausible. The need for virtual training to keep people connected is imperative. Yet the physical classroom remains a major delivery method, even though, for large numbers of participants, connecting virtually can be just as effective and more economical.

Economics is a reason to use e-learning, but only if you have the infrastructure in place. Companies that upgraded their technical infrastructure for Y2K, which

became a non-issue, were well positioned to move into e-learning after September 11, 2001. Those companies that decided to move to e-learning for economic reasons after 9/11 often found that the technical capabilities that were required were not there and that the investment in the required technology was too expensive.

There is still a lot of discussion about e-learning not meeting everyone's learning style. We like what our friend Susan Guest, the vice president of e-learning at Baxter Pharmaceuticals, said recently, "If you were in the financial and accounting business and you told your employer that you had a different accounting method, you would be told to use the system the company uses. However, we still say that e-learning won't work for everyone because it doesn't meet everyone's learning style, so we have to have a variety of ways to deliver training." We agree with Susan.

And with some of the great software we have seen recently, various learning styles are accommodated. It is not e-learning that has been holding learning back, but the design of e-learning. Too much e-learning has been designed using traditional methodology, much like taking an instructor-led course and delivering it through CBT or WBT. The two media require completely different constructs. Besides, instructor-led training that is basically lecture doesn't meet everyone's needs either. Auditory learners make up only about 30 percent of the total population. A well-constructed instructor-led course that uses action learning, activities, PowerPoint®, video, and games accommodates learning styles just as the same course would using e-learning. However, e-learning has the additional advantages of delivering a consistent message, is available on demand when the learner needs it, and reduces the costs and personal inconvenience associated with traveling to receive training. The "rule of thirds" is becoming pretty standard in the industry. "People retain one-third more, in one-third less time, at one-third the cost." This is well documented by the Department of Defense and can be found in Teitelbaum and Orlansky (1996).

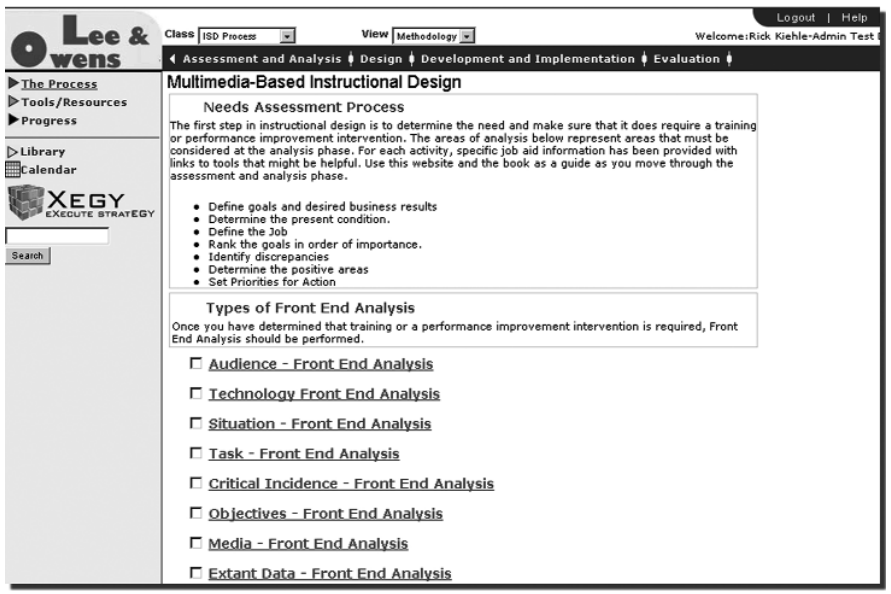
Noonan's (1993) message is even more relevant ten years after he wrote that if the training function is ever to escape "corporate America's basement," it must transform into an organization that ties solutions to business needs and help achieve corporate goals and objectives.

WHY BUY THIS BOOK?

One of the reasons to buy this revision, even if you have the original, is that we have improved many of the tools and added even more. The Media Analysis Tool in Chapter Eleven is now automated on the CD-ROM. We have also automated

our objectives analysis process in Chapter Ten. Yes, an automated tool that *almost* writes your objectives for you! The step/action table in Appendix A is also automated and is now called the Project Management Tool to track your instructional design activities and tasks. There is a special URL and password listed on the Links menu of the CD-ROM for Granite Technologies, the company that owns the tool called Xegy™ (pronounced x-è-g) that is used to automate the step/action table. This URL is available *only* to purchasers of the book. You have ninety days of free access to the Project Management Tool and can use it to track your projects and print the results. Figure I.2 shows the graphical interface of the Project Management Tool.

Figure I.2
Introductory Page of Automated Project Management Tool



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You can check off each activity and task as you complete it, but even more beneficial is the capability to click on any activity or step and immediately hyperlink to the online tools and worksheets that you use to complete that task. Xegy™ is a

new approach to focusing business intelligence to drive performance. It provides a performance support framework for:

- Rapid prototyping of a strategy roadmap
- Communicating that roadmap uniquely to different workgroups
- Supporting ongoing management of the process
- Tracking results and capturing input for continuous improvement and innovation

Non-technical people can harness technology to build and implement their strategies.

Figure I.3 shows the conceptual framework of Xegy™. The tool can be used as a process management tool, a project management tool, or a performance support tool taking both systems and human factors into consideration. To learn more about Xegy™, see the website www.xegy.com.

We have added chapters on Issue Analysis, developing an Evaluation Strategy, and creating an Evaluation Plan. We have also created a much more robust tool for evaluating e-learning software that replaces the one in the first edition. There is now a tool for making "build or buy" decisions if the solution must be customized or can it be purchased off-the-shelf.

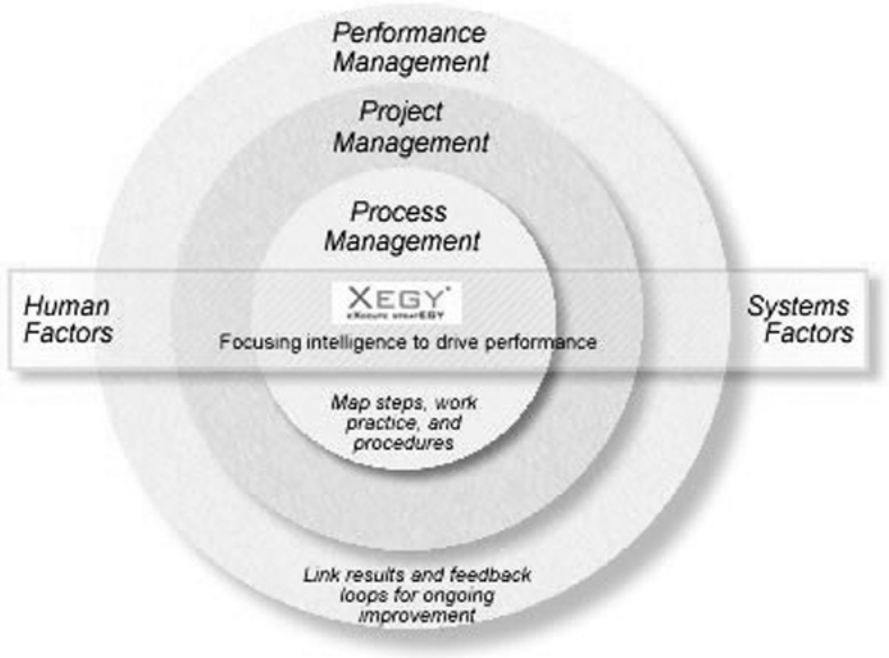
We have found many new examples of user interface design and restructured the section on design to reflect both the objectivist and constructivist theories of instructional design. These are only a few of the changes you will find in this edition.

Our integrated instructional design model transcends whatever media will deliver the solution and is still a major advantage of this book. There are numerous books on the market today on how to design and develop computer-based training, others for web-based training, and still others for distance broadcast training. So why buy this book rather than one of the others?

Other books are well suited for their specific delivery media, but the approach to the instructional design process differs in each one. Most use the traditional instructional design (ID) model with its phases of analysis, design, development, implementation, and evaluation, but they vary in the tasks and activities to complete during each phase.

Consequently, if you want to design for more than one medium, you have to buy a book on each and adjust or adapt your ID model depending on the medium.

Figure I.3
Xegy™ Conceptual Framework



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So why buy this book? Because it eliminates multiple procedures. Use the process in this book and design in any media!

Instructional designers are intelligent, creative people who eventually figure out how to meld the best components of each design model given time and experience. We all gain experience by working on multiple projects. But time is usually what we lack. We're often too rushed to reflect on what we did during a project that made it go smoothly—what we did to get over the bumps and around the roadblocks. The revised *Multimedia-Based Instructional Design* offers time-tested procedures and tools to encapsulate the experience of hundreds of course developers, thereby reducing the time required to reflect on past successes and

problems. Use our book as the basis for projects, and change only those steps you find work differently and better for your group than the way we suggest. The new automated Project Management Tool allows you to make this customization.

WHO SHOULD BUY THIS BOOK?

Our revised edition of *Multimedia-Based Instructional Design* is intended for the same audience as the first, but allows us to share the updated information and knowledge we have gained since the first edition. It is for course developers (instructional designers, authors, project managers) who are beginning their first multimedia project, as well as for experienced designers of large projects that require a systematic process that everyone can follow. It is well suited for use by project teams when there is a mixture of experienced and new developers. It imparts a consistent message to those project teams that find members matrixed in and out of projects and that use a combination of internal and outsourced resources.

Although the book discusses many issues encountered by internal training departments, multimedia consulting companies should also find the tools valuable and the tips for managing customer expectations enlightening.

FOCUS OF THE BOOK

Our philosophy is to focus on the human-performance arena. This focus presents challenges to multimedia development groups whose philosophy reflects a more traditional approach. We agree with Tom Gilbert (1996) that the purpose of all instruction is to affect human performance through learning or performance support. If multimedia development groups move into the human-performance area, they open new horizons of opportunities to work within an organization and become more valuable. We recommend Judith Hale's *The Performance Consultant's Fieldbook: Tools and Techniques for Improving Organizations and People* (1998) to help your group make the necessary shift to performance consulting. Lee and Krayer's *Organizing Change: An Inclusive, Systemic Approach to Maintain Productivity and Achieve Results* (2003) is also a good companion book to this one because it uses the instructional design model and expands its use to enterprise-wide solutions that can transform a training department into an organizational development department by providing the knowledge, skills, and tools to expand the department's capabilities. We also recommend Thomas Toth's book, *Technology*

for Trainers: A Primer for the Age of E-Learning (2003), and *E-Learning Tools and Technologies* (2003) by William and Katherine Horton. These books provide tactical development tips for e-learning solutions. We do not include a glossary of e-learning terms in this book because there is a very good one available on the International ASTD website (www.astd.org) that is continually updated.

We've all experienced working on projects for long hours, with budget overruns, missed deadlines, and unnecessary rework. We, too, have experienced the frustration associated with all of these situations. Our goal is to provide you with a handbook that helps you reduce cycle time for completing projects, makes your job easier, and conveys the lessons that will reduce your learning curve.

STRUCTURE OF THE BOOK

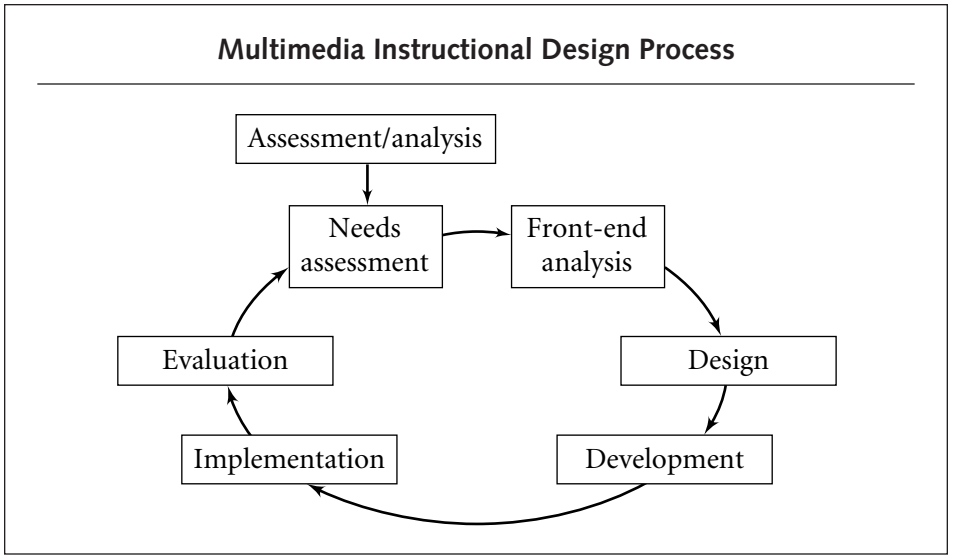
The book is organized in four parts:

1. Multimedia Needs Assessment and Analysis
2. Multimedia Instructional Design
3. Multimedia Development and Implementation
4. Multimedia Evaluation

Overall, it is structured as a step/action handbook that presents activities and the associated steps required for completing a successful project. We present tools to assist in organizing the information obtained from each activity. Appendix A is a step/action table (now automated on the CD as a Project Management Tool) that lists the steps to follow in each phase of the instructional design process. Project teams can follow the steps as listed or adapt them for their specific needs. The automated version allows you to track your progress through a project.

Each of the chapters is short. We wanted to provide you with critical information without too much extraneous information to get in the way of the way we want the book to be used—as an instructional design process manual.

The graphic that follows this paragraph appears (in varying form) at the beginning of each of the four parts of the book to identify the phase of the instructional design process to be discussed in that part. Note the circular configuration, to demonstrate the circular rather than linear nature of the process. Each phase of the ID process flows through to the next, and the last reflects back on the first. This is the concept of "congruence."



In Part One we follow Dick and Carey's model (1990) of separating the analysis phase of instructional design into two parts: needs assessment and front-end analysis. Needs assessment focuses on determining the current state and the desired state and the type of business issue the need arises from. Front-end analysis then determines how to close that gap with a results-driven solution. We address ten types of front-end analysis:

1. *Audience analysis:* determining who the target population is for the solution and their demographic as well as learning needs
2. *Technology analysis:* determining the type of technology available and technological considerations and constraints for delivery of the solution
3. *Situation analysis:* determining the environmental considerations in delivering the solution
4. *Task analysis:* determining the physical and mental requirements for getting the job done
5. *Critical incident analysis:* determining which tasks require that training or information be provided to the target audience
6. *Objective analysis:* determining the performance and instructional objectives for the solution and making the distinction between the types of objectives as

well as when and where to use them; also their impact on the content as well as delivery media

7. *Issue analysis:* categorizing analysis findings into organizational, performance and training issues
8. *Media analysis:* selecting the most appropriate delivery medium (or media) for a solution
9. *Extant data analysis:* determining what materials are available and which need to be developed—basically, making a "build-or-buy" decision
10. *Cost analysis:* determining the up-front benefit the solution has in comparison to the cost of the solution

We also include a rapid analysis model (RAM) in Chapter Fourteen. We developed this model for experienced course developers who intuitively understand the step-by-step process involved in gathering data through needs assessment and the nine types of front-end analysis.

In Part Two, Multimedia Instructional Design, we have provided the activities and steps required to produce a *course design specification* (CDS) document. We include many tips on project management for course developers to fully understand the complexities involved in multimedia projects. Such information should guide them in selecting media. For example, if assessment and analysis result in a web-based solution, the project team should know what's involved so they can determine whether or not the solution is realistic for their business and can assemble the required resources before the project starts. The complexities might, though, result in choosing another solution.

Part Three is on multimedia development and implementation. Here there is divergence of methodology depending on the media. Therefore, we begin with a chapter on common elements of development and implementation and then explain the particular aspects for computer-based, web-based, distance broadcast, and performance support solutions. We also differentiate the design issues between objectivist and constructivist theories of instruction and their impact on multimedia. We also discuss SCORM (Searchable Content Objects Reference Model) standards and their impact on e-learning development.

Even if different groups perform the authoring and designing, designers should know the complexities involved in the solution they propose in order to determine whether or not the solution is feasible. Designers should also be able to carefully

consider the issues related to implementing a solution. To broaden the knowledge and skills of designers, we have included a discussion on many development topics. We explain the influence of *learning management systems* (LMS) on implementation. Course developers are expected to acquire increasingly broad skill sets and are becoming the authors of what they design, so we also discuss and provide examples of *rapid development tools* (RDT) that are designed to reduce the amount of time required for developing e-learning by using templates that require less authoring.

Part Four is on multimedia evaluation. We discuss evaluation from two perspectives: the strategic and the tactical. To address strategic issues, we have included a chapter on how to develop an evaluation strategy for your organization to measure reaction, knowledge, performance, and cost. We provide the templates and a completed model of an evaluation strategy. A crossover tool from strategic to tactical is an e-learning evaluation tool that can be used if you are considering buying off-the-shelf e-learning or to be certain that you include the necessary components in custom-developed e-learning that you build internally. This evaluation tool is a companion to the new tool that assists in making "build or buy" decisions in Chapter Twelve, Extant Data Analysis.

To address tactical issues, we have included a template for an evaluation plan that you should develop for each project. The template includes all of the issues you should consider for the evaluation plan. We still have chapters on designing, developing, and delivering tests and test validity and reliability. We present the steps for constructing various types of objective tests and explain the strengths and weaknesses of each type.

Throughout, we have included sections on applicable learning and instructional design theory as a basis of "why we do what we do." People outside of the human performance arena often don't see the need for particular aspects of development. They don't understand the basic human characteristics surrounding learning that require us to include certain components. We have laid out the theory to help you explain why to them.

We also provide sections in most chapters on our personal experiences, to help you avoid the pitfalls we have experienced and replicate the successes we've had. Yet another section in each part of the book explains how e-learning, especially the Internet and web-based technologies, requires us to change the way we think about the traditional instructional design model.

In total, we present a replicable model, adaptable to any delivery medium, diverging only in the development phase of multimedia projects.

THE CD-ROM

The CD-ROM that accompanies this book contains tools we developed that are meant to be modified to meet your particular project requirements, including the following:

- *Project Management Tool:* this automated tool is a complete checklist of all activities and steps in the multimedia instructional design process as laid out in this book. The checklist is also found in Appendix A. On the CD-ROM, we provide you with the URL for a website that you can access to download the tool and use it to track your projects.
- *Tools and templates:* the tools directory contains checklists and templates for each phase of the ID process. These tools and templates can be copied and used as-is or customized to meet your needs and used for multiple projects. The directory is divided into sections for assessment and analysis tools, design tools, development and implementation tools, and evaluation tools. A hard copy of each tool is also included in the Appendix (look for the CD-ROM icon): so you can browse through and determine whether and how each one applies to your project.
- A link to Centra Software's synchronous web-based tool, which explains how the web-based delivery software works.
- A link to Intellinex, a set of rapid development templates that demonstrate the ability to create e-learning without having to possess sophisticated authoring skills
- An automated version of the Media Analysis Tool found in Part One that will calculate your responses on each of twenty-four factors regarding the content, audience, and cost of various delivery media and provide a chart that lays out a hierarchy of potential components of a blended learning solution
- An automated version of the objective analysis process we outline in Part One that will assist you in writing measurable performance, terminal, and lesson objectives

Hardware/Software Requirements and Launch Instructions

The tools found on the CD-ROM require you to have access to a PC running Microsoft Word.

System requirements for the automated objectives tool include:

1. Pentium 100 MegaHertz CPU or above with minimum of 64M of memory and 5M free hard drive space.
2. Microsoft Windows® Operating System (WIN9x/2000/ME/XP).
3. Internet Explorer® 5 or above.
4. Java Runtime 1.3 or above.

Instructions to Run Automated Objectives Tool

If you have a high-speed Internet connection:

1. Launch objWizard.htm from CD directly by double clicking on the file. Follow the instructions on screen to download and install Java Runtime 1.3.
2. Automated Objectives Analysis Tool content will show up after Java Runtime 1.3 is successfully installed.

If you don't have a high-speed Internet connection, or if Java Runtime download fails:

1. Run j2re-1_3_1_06-windows-i586.exe program from CD directly. Follow the instruction on screen to install Java Runtime 1.3.
2. Launch Automated Objectives Analysis Tool by double clicking on objWizard.htm from CD.

System Requirements for Automated Media Analysis Tool

1. Pentium 100 MegaHertz CPU or above with minimum of 64M of memory and 5M free hard drive space
2. Microsoft Windows Operating System (WIN9x/2000/ME/XP)
3. Internet Explorer 5 or above

Instructions to Run Media Analysis Tool

Simply double click on MediaAnalysisTool on the CD ROM Menu.