

Model-Based Requirements Engineering with Use Cases™ Workshop

— tool-independent edition, works with UML/SysML —

Although Use Cases are among the most popular object modeling techniques for specifying requirements, they are also among the most abused. Improve your Verification & Validation process with this pragmatic workshop that shows how to effectively apply Use Cases and visual requirements to satisfy and verify system requirements.

The object modeling techniques for defining functional requirements as Use Cases can be traced to telecommunication applications during the 1980's. Since that time many methodologists have contributed to refine and broaden this simple but powerful requirements definition technique, **making Use Cases one of the most popular object modeling techniques currently used.** Unfortunately, the broadening of Use Case modeling techniques has often resulted in diluted semantics and rigor, since a wide range of informal text-based and visual modeling techniques are now covered under the umbrella term *Use Cases*. As a result, **the “Use Case Abuse” anti-pattern has become rampant and threatens the success of many model-based projects.** If not detected and treated early, this deadly development process syndrome can result in chronic schedule slippage or project failure.

This introductory Model-Based Requirements Engineering workshop **explains the principles and best practices for defining Use Cases and visual requirements**, and shows how to apply them in a rigorous and efficient manner. It explores both basic and advanced Use Case modeling techniques, and shows how to visualize requirements using both standardized and proprietary Requirement diagrams. The workshop shows how UML Use Cases can be defined by text descriptions as well as with visual modeling techniques (Activity diagrams, Sequence diagrams). Students who desire integrated modeling tool training may also choose editions of this workshop that are customized for popular UML/SysML modeling tools. (For a list of workshops customized for popular modeling tools see the [Training](#) page of the PivotPoint web.)

WHY TRAIN WITH US? – PIVOTPOINT TRAINING ADVANTAGES

- PivotPoint workshops are **authored and taught by Model-Based Engineering experts** with 10+ years practical application experience.
- PivotPoint workshops are **intense (high Instructor/Student ratio) and pragmatic—punctuated with frequent Q&A sessions and hands-on practice exercises.**
- PivotPoint workshops are **based on proven tool-independent principles and techniques**, so you can learn a leading modeling language or architecture framework with/without a modeling tool. (For a list of workshops customized for popular visual modeling tools see the *Training* page on the PivotPoint web.)
- PivotPoint workshops are **modular and can be customized to meet your team and project needs.** To begin with, you can pick-and-choose your modeling language, and then select from modeling tool and architecture framework training options.
- PivotPoint workshops **offer flexible choices of venues (onsite, offsite, webconference) and durations (#days).**

For more details about the advantages of PivotPoint's Model-Based Engineering training check out the [“Why Train with Us?”](#) page on the PivotPoint web. But don't just take our word for it; you should also check out the [Client Testimonials](#) page on our web.

Workshop learning objectives, prerequisites, syllabus, and logistical information are described below.

WHAT WILL YOU LEARN?

- What is Model-Based Requirements Engineering, and why do we visualize requirements?
- What is a Use Case, and how do they define functional requirements?
- How Use Cases can specify functional requirements for large, complex systems
- How Use Cases can specify User Interface requirements and system Test Cases
- What is a visual Requirement, and how do they complement Use Cases?
- Practical guidelines for visualizing correct, complete, clear, consistent, and concise requirements
- How to use other UML2/SysML visual modeling techniques to define functional and non-functional requirements
- How to select Use Case tools and Use Case-driven methods
- How to customize Use Cases for your problem domain
- How to draw visual requirements using a selected UML2/SysML tool (optional; see popular UML2/SysML modeling tools supported on the *Training* page of the PivotPoint web)
- How to learn more about Model-Based Requirements engineering

WHO SHOULD PARTICIPATE?

Business analysts, architects/engineers/developers, systems engineers, project managers, and others who want to learn how to improve how they specify, satisfy and verify system requirements will benefit from this workshop.

PREREQUISITES: Software development or systems engineering experience in building large, complex systems. Experience using one or more structured analysis/design, object or component methods is desirable.

WORKSHOP AUTHOR & CHIEF INSTRUCTOR



Cris Kobryn is the CEO and Founder of PivotPoint Technology Corporation, a company that specializes in Model-Based Engineering Solutions™ for tough business and engineering problems. He is an internationally recognized expert in visual modeling and Model-Based Engineering, and has successfully applied these technologies to diverse industries ranging from aerospace-defense and communications to financial services and manufacturing. Cris chaired large international teams of vendors and users to specify the Unified Modeling Language (UML) 1.x and 2.0 standards for software engineering, and the Systems Modeling Language (SysML) 1.0 standard for systems engineering. In recognition of Cris's contributions to the UML the Object Management Group (OMG) presented him with its Distinguished Service Award, and in acknowledgement of his contributions to the SysML the International

Council on Systems Engineering (INCOSE) presented him with its Outstanding Service Award.

WORKSHOP SYLLABUS: The workshop syllabus, in a menu form that can be customized to meet your team/project needs, is described at the end of this document. NOTE: This workshop description and syllabus are subject to revision. Check the *Training* page on the PivotPoint web for the most recent update.

FLEXIBLE VENUES: All of our workshops are available onsite (at a Client training facility), offsite (at a PivotPoint training facility), and via webconference.

FOLLOW-UP CONSULTING/MENTORING SERVICES: All of our workshops can be followed up with consulting/mentoring services that will keep your Model-Based Engineering project on track. Please check out the Consulting services page on the PivotPoint web, or contact us to discuss details.

SCHEDULING AND COST: Workshops must be reserved in advance by Purchase Order or prepayment. We generally require at least 4 weeks lead time for scheduling workshops, but longer lead time is desirable to reserve your preferred training dates. Workshop cost depends upon workshop duration (number of days), venue choice (onsite, offsite, webconference), and number of students.

FURTHER INFORMATION & PRICE QUOTES: Please visit our web site at www.PTCorp.com, email us at workshops@PTCorp.com, or call us at +1-760-201-0200 to discuss workshop details and receive a price quote.

WORKSHOP MENU

All PivotPoint workshops include both structured presentations and interactive hands-on work sessions to reinforce learning principles and best practices. In addition, workshops can be customized to include optional modeling tool training, or to address special project or team requirements.

- **2 day workshop** includes: *MBRE – Basic*, and one of the following learning modules: *MBRE – Intermediate*, *MBRE – Basic Modeling Tool* or *MBRE – Project Practicum*.
- **3 day workshop** includes: *MBRE – Basic* and *MBRE – Intermediate*, and one of the following learning modules: *MBRE – Basic Modeling Tool* or *MBRE – Project Practicum*.
- **4 day workshop** includes: *MBRE – Basic* and *MBRE – Intermediate*, *MBRE – Basic Modeling Tool*, and *MBRE – Project Practicum*

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| <p style="text-align: center;">MBRE – BASIC [Module# RE101]</p> <p>Introduction</p> <ul style="list-style-type: none"> • Model-Based Engineering & Model-Based System Engineering • Basic concepts • Principles and best practices <p>Use Case Techniques</p> <ul style="list-style-type: none"> • Specifying Use Case diagrams • Realizing Use Cases with precise natural language • Realizing Use Cases with Sequence diagrams (UML2/SysML) • Realizing Use Cases with Activity diagrams (UML2/SysML) <p>Visual Requirement Techniques</p> <ul style="list-style-type: none"> • Specifying requirements as first-class visual constructs • Defining, satisfying, and verifying requirements using standardized SysML Requirement diagrams • Defining, satisfying, and verifying requirements using proprietary Requirement diagrams | <p>Goals</p> <ul style="list-style-type: none"> • Understand the advantages of a Model-Based Requirements Engineering approach • Learn the basic concepts and principles for modeling functional requirements with Use Cases • Understand how to specify performance requirements with Constraints • Compare and contrast visual model and text-based descriptions of Use Cases • Understand how to specify a correct, complete, concise, and consistent Use Case model |
| <p style="text-align: center;">MBRE – INTERMEDIATE [Module# RE102]</p> <p>Topics</p> <ul style="list-style-type: none"> • Specifying User Interface requirements with Use Cases • Specifying Test Cases with Use Cases • Specifying non-functional requirements, including performance requirements • Verifying and validating Use Cases/Requirements • Use Case/visual requirement model management • Customizing Use Cases/Requirements for your problem domain <p>Modeling Techniques</p> <ul style="list-style-type: none"> • Specifying functional requirements and test cases <ul style="list-style-type: none"> ○ Sequence diagrams (UML2/SysML) ○ Activity diagrams (UML2/SysML) • Specifying performance requirements <ul style="list-style-type: none"> ○ Constraints (UML2/SysML) ○ Parametric diagrams (SysML only) | <p>Goals</p> <ul style="list-style-type: none"> • Learn how to manage large and complex Use Case/Requirement models • Understand how to specify UI and Test Case requirements with Use Cases • Learn how to verify and validate Use Case/Requirement models • Understand how to customize Use Case/Requirement models for your problem domain |

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| <p style="text-align: center;">MBRE – BASIC MODELING TOOL: OPTIONAL</p> <p style="text-align: center;">[Module# RE111]</p> <p><i>[All Model-Based Engineering workshops are based on tool-independent principles and best practices. If you have already chosen a UML/SysML modeling tool, we can integrate optional tool training into your workshop. If you have not, we can help you select one that best meets your project and team needs. For a list of workshops customized for popular modeling tools see the Training page of the PivotPoint web.]</i></p> <p>Topics</p> <ul style="list-style-type: none"> • Specifying Use Cases • Specifying visual requirements <p>Diagram Techniques</p> <ul style="list-style-type: none"> • Use Case diagrams • Class diagrams • Sequence diagrams • Activity diagrams • SysML Re • Other diagrams (TBD) | <p style="text-align: center;">Goals</p> <ul style="list-style-type: none"> • Gain familiarity with the user interface and basic features of selected UML/SysML/BPMN modeling tool • Learn how to model most common UML diagram types using selected modeling tool • Understand the strengths and weaknesses of selected modeling tool • Assess UML and XMI standards compliance for selected modeling tool |
| <p style="text-align: center;">MBRE – PROJECT PRACTICUM</p> <p style="text-align: center;">[Workshop# RE121]</p> <p>The project practicum provides an opportunity to apply Model-Based Requirements Engineering modeling principles and best practices to solve project modeling problems in a creative and supervised workshop environment. The practicum can be used to facilitate:</p> <ul style="list-style-type: none"> • Use Case/Requirements model peer reviews • Use Case/Requirements model revisions and extreme makeovers <p>Students can identify project modeling problems in advance, or Instructor will work with students to identify them.</p> | <p style="text-align: center;">Goals</p> <ul style="list-style-type: none"> • Identify the Use Case/Requirements modeling principles and best practices that are most important to your team and your project • Apply advanced Use Case/Requirements modeling techniques to project problems that you choose |