Framework Assisted Design

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Levels of Abstraction

- Reference Models Describe Abstracted Aspects of a Domain
- Models Describe a Particular Instance of a Domain, Leveraging the Abstract Concepts
- Frameworks Embed the Knowledge of the Reference Model into the Modeling Environment to Provide Real Time Guidance and Control
Framework Pros & Cons

• Modeling Frameworks Succeed Because They...
  • Provide Guidance
    • By abstracting away technical details
    • By incorporating experts’ knowledge
  • Promote Consistency
    • By providing domain knowledge
    • By making it easier to design to standards than not to
  • Ensure Conformance
    • By finding infractions
    • By making it easier to correct infractions
• **Modeling Frameworks Fail Because...**
  
  • They are not adaptable, forcing you to use their rigid approach
  • They impose an additional burden on designers who then resist their use
  • They are too limited in their scope and do not work with other frameworks
  • They are focused on the capturing of information but not on robust reporting mechanisms to provide a strategic vision from the models
  • New releases of the framework do not address model synchronization creating a maintenance nightmare

• **Frameworks Need to be Managed Along with their Models**
A Good Modeling Environment Provides...

- **Framework Assisted Design (FAD) & Automation**
  - Using framework (domain) knowledge to make things easier

- **Model Assisted Design (MAD) & Automation**
  - Using model information to make things easier

- **General Automation Tasks**
  - Extending general EA’s capabilities to make things easier
Framework & Model Management

- Provide Lifecycle Management of Profiles and Frameworks with Minimal Turn-around Time

- Provide Framework Aware Automation to Control Input to your Models

- Provide Model Aware Automation to Make Designing Easier

- Minimize Workflow Interruption Using a Series of Floating Control Panels
Managing Your Frameworks and Models Requires...

- The flexibility to create and change your frameworks
- An integrated approach to framework development and model synchronization
- Addressing more than one area of concern with multiple, interoperating frameworks targeting different stakeholders
- Providing the appropriate level of tool support, governance, and reporting to ensure that your models meet the needs of your stakeholders
What is Model Guardian?

• Model Guardian is an Extension to Sparx Systems’ Enterprise Architect UML Design Tool

• Model Guardian Provides...
  • A framework management system
  • A framework/model synchronization system
  • A modeling environment that provides tools and governance

• Pre-defined Frameworks
  • OAD Systems and its partners are developing pre-defined frameworks for use with Model Guardian, providing you with a head start
  • The (EA)2 Enterprise Architecture Modeling Framework is now part of the Model Guardian family of frameworks

• Your Custom Frameworks
What is Model Guardian?

- Enterprise Architect Lets You Extend UML with Domain Specific Toolboxes and QuickLinks (UML Profiles)
What is Model Guardian?

• Model Guardian Makes Creating Frameworks (Profiles++)
  • Easier
  • More intuitive
  • Faster
• With a User Interface that Addresses
  • Element and Connector Types
  • Tag Definitions
  • Relationships and QuickLinks
  • Toolboxes and Toolbox Sections
  • Diagram Types
  • And more
What is Model Guardian?

- Model Guardian’s Comprehensive User Interface...
  - Leads you through the process of developing your framework
  - Provides an iterative, incremental approach to framework development

The Model Guardian User Interface
The User Interface Has Two Sections

- Metatype hierarchy of object and connector metatypes
- Editor consisting of seven tabs
  - Object Types
  - Connector Types
  - Tag Definitions
  - Relationships
  - Toolbox Sections
  - Toolboxes
  - Diagram Types
• The Meta Type Hierarchy
  • Shows the structure of the framework
  • Provides an understanding of how the meta types inherit tags and relationships from their ancestors
  • Synchronizes with the Editor to show where the current meta type is within the hierarchy
Object Types

• The Framework Editor Section...
  • Lets you manage your framework elements
  • Makes the elements immediately available via drop down lists
• **Lets Look at...**
  
  • Using the Framework Editor to Design your Framework
  
  • Applying the Framework to the Modeling Experience
Defining Object Types

- Object Types Become Toolbox Elements
  - Hierarchical metamodel for inheriting tags and relationships
Defining Connector Types

- Connector Types Become Toolbox Elements
  - Hierarchical metamodel for inheriting tags and relationships
Defining Tag Definitions

- Create Tag Definitions using EA’s Native Format
• Relationships
  • Define the Relationships and resulting QuickLinks
  • Child Elements inherit the Relationships
  • In (EA)2, 76 Relationships yielded over 1200 QuickLinks
Defining Toolbox Sections

- Define Toolbox Sections Consisting of...
  - Framework metatypes (object and connector types)
  - UML types
Defining Toolboxes

- Define Toolboxes Composed of Toolbox Sections
Defining Diagram Types

- Define Diagram Types with their Associated Toolbox
Now that the Framework has been Designed, how do You create the MDG file for Enterprise Architect?

- Simply restart Enterprise Architect!
- The MDG is automatically created at start up from the Model Guardian framework file
- Only one file must be deployed for others with the runtime version of Model Guardian to use the framework
Framework Lifecycle Management

- Framework Development and Release
  - Design the framework in a WIP area
  - Release the finished framework to production
  - Manage archived versions of the framework
Leveraging Your Framework and Models

• **Framework Assisted Design (FAD)**
  - Leveraging the framework to provide guidance

• **Model Assisted Design (MAD)**
  - Leveraging the model contents to provide guidance
Use the Relationship Definitions from the Framework

- Select a model element, select one of its allowed relationships, select from a list of all of the candidate elements that can be on the other end of the relationship.
FAD – Global Stereotype Changes

- Change a Stereotype for all Elements/Connectors with the Stereotype
- Synchronize Tagged Values
- Optionally Delete Non-framework Tags
- Bring Elements/Connectors Created Outside of the Framework Under Framework Control
• Change a Tag Name for all Elements/Connectors with the Tag

• Fix Tag “Orphans” When Changing a Tag Definition’s Name in EA Leaving Tags Depending on that Definition Orphaned
Check Conformance to the Framework

• Connector Cardinalities
Check Conformance to the Framework

Tag Cardinalities (How many birthdate tags should a Person have?)
• Check Conformance to the Framework
  • Existence of non-framework defined tags
Frameworks Mature over Time

- If models cannot be synchronized with framework changes they become obsolete
• Synchronize Individual Elements and Connectors
MAD – Auto Location of Elements

- Use Diagram References to...
  - Create elements in the appropriate package
    - Drag elements from the Toolbox onto a diagram reference to create the element in the package containing the referenced diagram
  - Move multiple elements to multiple target packages
    - Drag existing elements onto various diagram references and select the menu option to move the elements to the target packages
  - The following slide shows a Business Model Canvas diagram consisting of diagram references used for controlling element destinations
• Dropping New Elements on Diagram References Auto-Locates the Elements
• Use Element Relocator Dialog to Relocate Elements
  • Lists packages that contain elements with the same stereotype
MAD – Update Numerous Connectors

- Select Connectors to Change
- Select Characteristics to Change
MAD – Update Numerous Connectors

• Highlight Selected Connectors for Confirmation

Slide 38
• Apply the Changes

Set Up Skeleton Schedule

Loop over each Game

Schedule with Officials
[Continue]

Schedule w/o Officials

Schedule Game

Game scheduled?
[Yes]

First attempt?
[No]

Failed due to lack of Official assignment?
[No]

[Yes]

[No]

[Yes]

[No]

[Yes]

[No]

[Yes]

[No]
MAD – Find Where Data Flows

- Find Connectors with Conveyed Information
- Locate Elements and Connector in EA
- Works with Exposed Interfaces
Search for Diagrams Filtered by...

- Name, Stereotype, UML Type, MDG metatype

![Diagram search interface](image-url)
• **Controlled Diagram Copying**
  - Copy only selectable elements
  - Copy only non-selectable elements (effectively making the source diagram a template)
  - Copy both types
MAD – Avoid Duplicate Elements

• When Creating a New Element
  • Look for existing elements with the same name
  • Choose to...
    • Use an existing element and place it on the diagram
    • Change the new element’s name
    • Use the duplicate name
Framework Specific Automation

- Model Guardian Adds Automation for Specific Frameworks
  - Example: \((EA)^2\) Enterprise Architecture Modeling Framework
• **(EA)**² Provides a Service Oriented Approach to Architectural Requirements
  
  • Elements from higher layers require services from elements in lower layers
Vertical Slices Show the Elements and Services Required to Realize a Business Process for a Particular Roadmap Phase
• **Service Tags on...**
  • Elements show the services they require and those they provide
  • Connectors show which of its services a provider provides to the client

• **Lifecycle Tags on...**
  • Elements show when they are/will be/were available
  • Connectors show when the provider provides the services to the client
Framework Specific Automation

- Model Guardian Can Automatically Color Elements and Connectors According to Their Availability During the Roadmap Phase
Framework Specific Automation

- A Dialog Shows the Results and Lets You Click Through to the Elements or Connectors to Make Adjustments
Framework Specific Automation

- A Dialog Shows the Results and Lets You Click Through to the Elements or Connectors to Make Adjustments
Framework Specific Automation

- The Color Mapping Feature has been Generalized to Work with Any Elements and Connectors that have the Lifecycle Tags
- Model Guardian Also Adds Automation for Managing the Service Provisioning
  - Assign required and provided services to elements
  - Assign service providers along with when they will provide the services
  - Manage service provisioning via connectors
Framework Specific Automation

- Assign Required and Provided Services to Elements
• Assign Service Providers along with When They will Provide the Services
Framework Specific Automation

• Manage Service Provisioning via Connectors
  • Add services and lifecycle dates to the connectors by selecting from the provider’s set of provided services
Framework Specific Automation

• OAD Systems Can...
  • Address custom automation needs you may have
  • Provide training and online mentoring on developing and using frameworks
Framework Assisted Design

with

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