ENTERPRISE ARCHITECT

SPARX SYSTEMS

MBSE and Enterprise Architect

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Overview

- **MBSE Market since 2008**
  - Advances & Challenges
- **Customer Experiences**
  - What our customers really think
- **The Road Ahead**
  - Future MBSE/SysML Opportunities

MBSE Market since 2008

- **Advances**
  - Early-adoption projects, technology evaluations
  - Overall positive reception to MBSE/SysML
  - Greater utilization
    - Interface definitions
    - Components Procurement ‘Library’
    - Parametric Modeling & Simulation
    - Integration with Requirements management, UML, Software
  - Education Outreach
    - Strong support in US for MBSE courses & programs

MBSE Market since 2008

- **Challenges**
  - Tool interoperability
    - Vendor support
    - Standards ‘maturation’
    - OMG MIWG – Working to address
  - Outcomes of ‘early adoption’
    - Notational ‘quirks’ (Flows, Flowports)
    - ‘How much UML’ vs ‘How much SysML’
  - Tool ‘Branding’
    - UML-centricity of tools (vs SysML-only tools)
  - Education Outreach
    - Outside the US? (Australia New Zealand?)

Customer Experiences

Then and Now comparison…

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The Customer - 2008

- **Customers – Demographics**
  - Trainers / Educators
  - Contractors / Consultants (self-employed)
  - RnD Engineers
- **Customers – Usage Behavior**
  - System Engineering
    - Modeling new, real-world designs, concepts
    - Capturing existing designs for documentation
    - Small-scale projects - <10 personnel

The Customer - 2011

- **Customers – Demographics**
  - Trainers / Educators
  - Contractors / Consultants (self-employed)
  - System Engineers, Architects, BA,

- **Customers – Usage Behavior**
  - Small-Medium Projects (<10, < 50 personnel)
  - Onboard SysML into larger projects
  - Capturing Existing Designs
  - Capturing Organisation IP for reuse
    - Patterns and Templates

Customer Experiences - 2008

- **Customers – Usage Behavior…**
  - Value – Added Modeling
    - Using Sparx SysML to extend their own products/services
    - Training, product extensions
    - Many of these users are Sparx Registered Partners
  - Evaluation
    - Evaluating our product (users are savvy in SysML, reviewing our product for procurement)
    - Evaluating the technology (users are savvy in Systems Engineering, reviewing SysML as a technology)

Customer Experiences - 2011

- **Customers – Usage Behavior…**
  - Value – Added Modeling
    - Requirements Management integration (eg: integration with Teamcenter SE)
    - Unification of Requirements, System Models, Software Models
    - Defining best practices, reusable assets (templates, patterns, workflows)
  - Evaluation
    - Beyond the evaluation phase
    - Identifying real-world opportunities to apply best practice MBSE concepts
    - Improve and evolve SysML as a result - v1.4

Customer Feedback - 2008

- **What they like**
  - Value-for-money
    Cost-effectiveness of EA + SysML
  - Ease of Use
    User Interface less imposing to the SysML-novice
  - Scalable deployment
    Multi-user capable using DBMS repositories
- **What they want improved**
  - SysML implementation is dated, needs updating (1.1)
  - Interoperability with other SE tools *important*

Customer Feedback - 2011

- **What they like**
  - Value-for-money
    Cost-effectiveness of EA + SysML
  - Ease of Use
    User Interface less imposing to the SysML-novice
  - Turnkey Solution
    Enough essential tools to start using SysML

- **What they want improved**
  - SysML implementation will need updating (1.3)
  - Interoperability with other SE tools still *important*
  - Parametrics & simulation support

The Road Ahead

Future MBSE opportunities…

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The Road Ahead

- **MBSE Methodologies**
  - Processes & workflows
  - Industry-standard (OOSEM)
  - Market opportunity for others to adapt to SysML (RuP, Iconix)
- **Testing**
  - Model-driven testbenches
  - Test-driven-design
  - Automated test regiments
    - Generate Test Cases
    - Generate Test ‘scripts’

The Road Ahead

- **Reporting Sophistication**
  - Architecture Completeness
  - Architecture Correctness
  - Design Rule Constraints
    - eg: Block X incompatible with Part Y
- **Architecture ‘fusion’**
  - UML, SysML, BPMN, UPDM, SMOF
  - Greater emphasis on dealing with design problem at hand in the ‘right perspective’ of problem focus

Conclusion

- **Increased adoption**
  - <10% of total userbase
  - Early Adopters, integrators, SEs ‘real customers using SysML in real projects’
- **Language Maturity**
  - UML - 10+ years to evolve to a ‘usable state’
  - SysML - 6+ years to evolve to the same usable state
  - Impact of SysML to model industry/market
    - ‘Real Test’ for model technology vendors, practitioners, contributors
    - Unprecedented advancements in model technology evolution
    - We all benefit in the end!

MBSE and Enterprise Architect

Backup Slides

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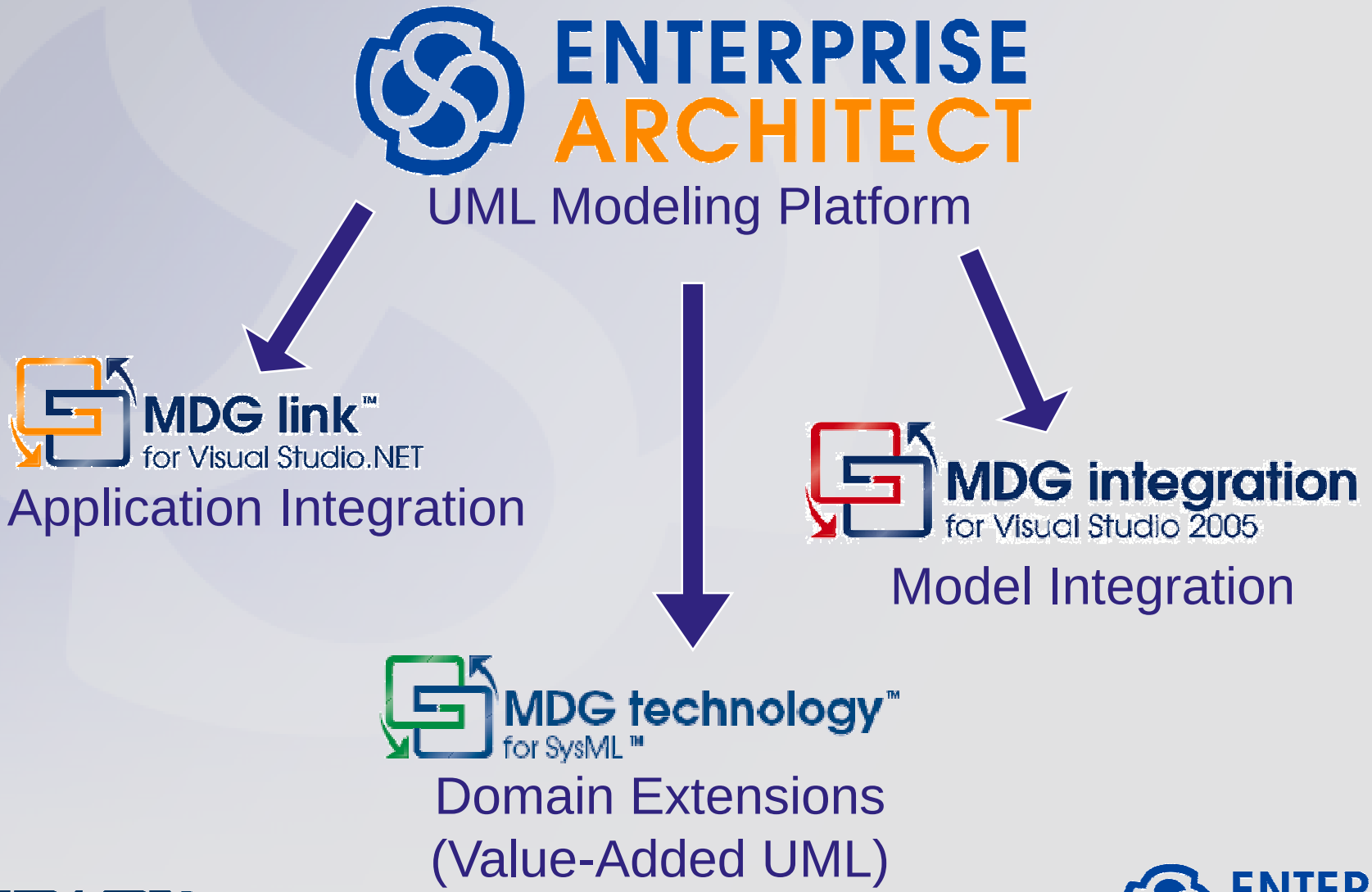
Who is Sparx Systems?

- **Established in 2000**
- **Leading provider of UML modeling tools**
  - Enterprise Architect for UML 2.3
  - Model Integration with 3rd Party tools
    - Visual Studio, Eclipse, DOORS, Visio, Teamcenter
  - Support for other modeling standards
    - Business Process Modeling Notation (BPMN)
    - OMG Systems Modeling Language (SysML)
    - Architecture Frameworks (DoDAF/MoDAF, Zachman Framework, ToGAF)

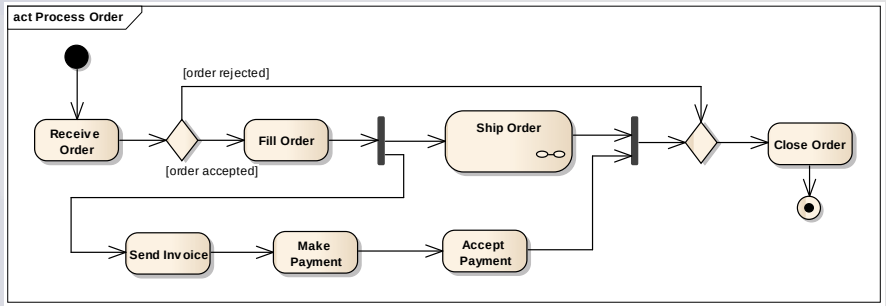
The Sparx Product Line



Enterprise Architect

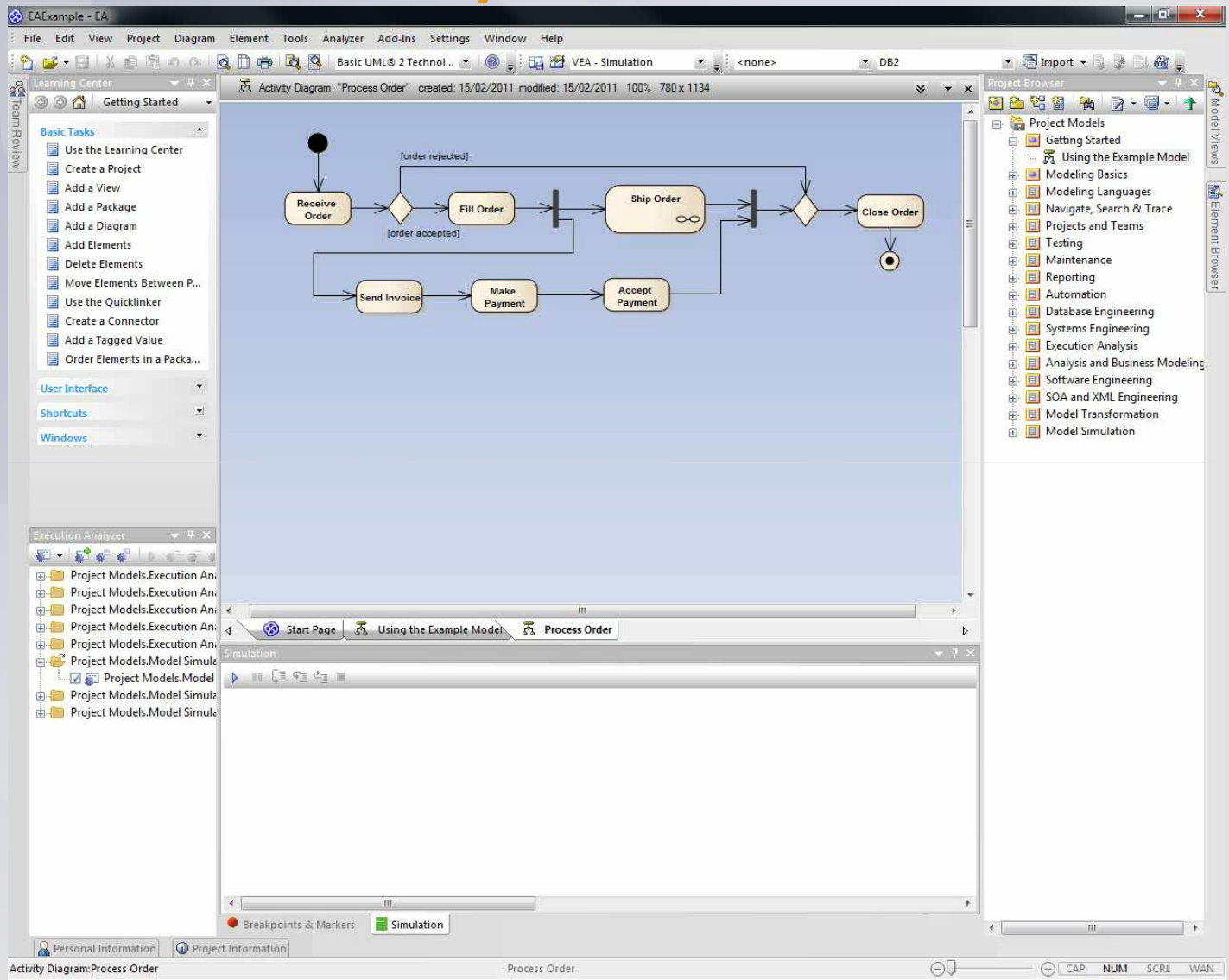
- **Our Flagship UML 2 Modeling Platform**
  - All 13 diagrams supported
  - Over 250,000 licenses worldwide
- **Visual Requirements Modeling**
  - One of the first providers to offer visual requirements
  - UML 2 Extensions to model requirements
    - Requirements, Feature, Change, Issue
  - Seamless traceability between formal specifications and system specifications within the model

Execution / Simulation



- **Enterprise Architect 9**
  - Visual Execution Analyzer
    - Generic execution framework
    - Variables, breakpoints, stack
    - Software debuggers (Native, .NET, Java, PHP)
    - Model Simulator (Basic UML)
- **Core Works**
  - Today
    - Simple Activity, State Machine, Interactions
    - Verify semantics of behavior execution (conceptually)
  - Tomorrow
    - Formal execution semantics, fUML
    - Business Process simulation
    - Parametrics

Execution / Simulation



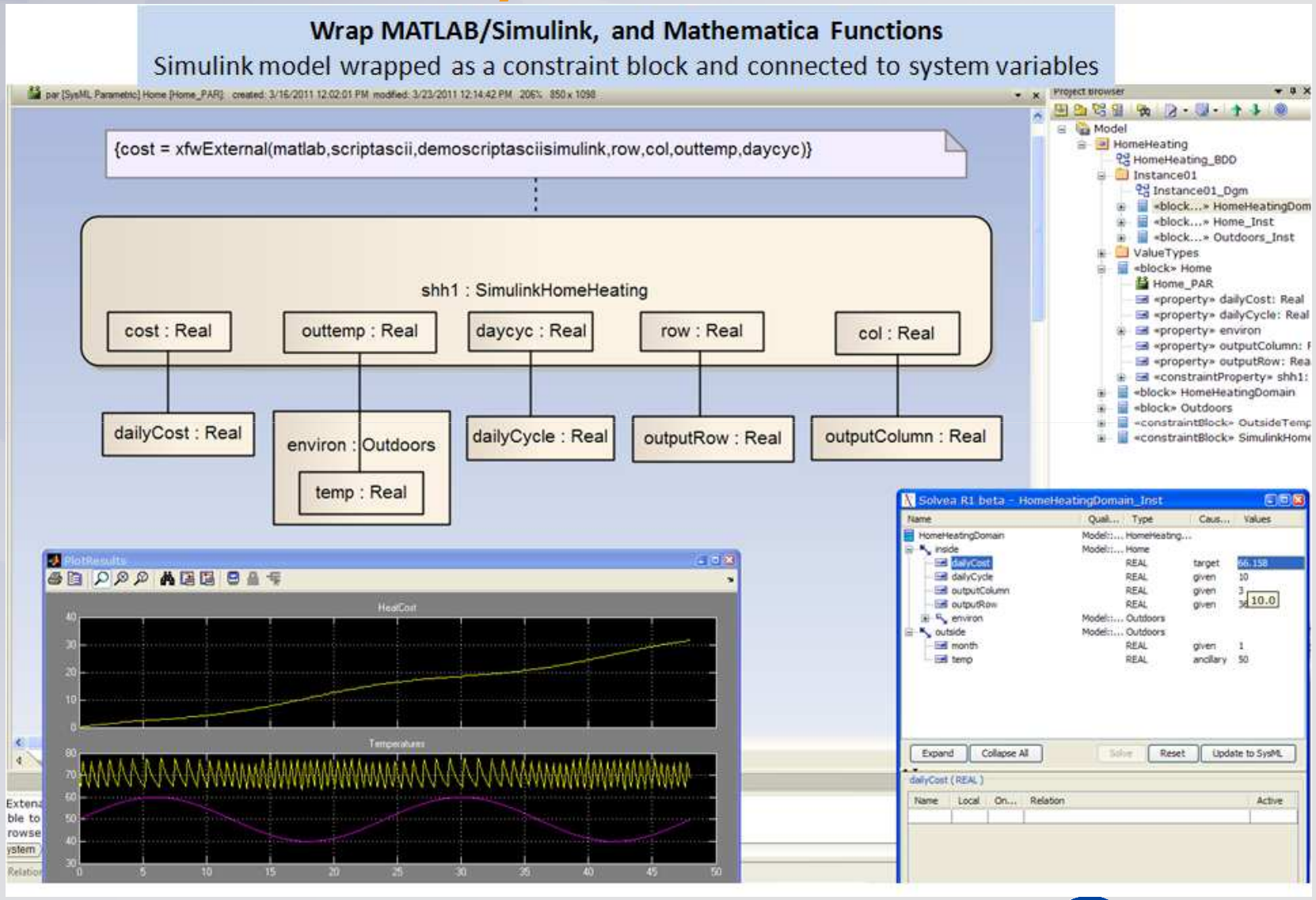
Execution / Simulation

- **3rd Party Addins**
- **AMUSE**
  - Web: http://lieberlieber.com/amuse
  - Advanced Modeling UML Simulation & Execution
  - Interactive Prototyping & Model Execution Environment
    - Supports UML & SysML models
    - Code Generation for Embedded Systems

Execution / Simulation

- **3rd Party Addins**
- **Solvea *new**
  - Web: http://www.intercax.com/solvea
  - Advanced Parametric Solver & Integrator for Enterprise Architect
  - Connectivity to
    - Excel
    - Mathematica
    - MATLAB/Simulink
  - Available now as Beta

Execution / Simulation



thank you for your attention!