



# Zeligsoft CX™

## Empower Your Embedded Systems Development Team

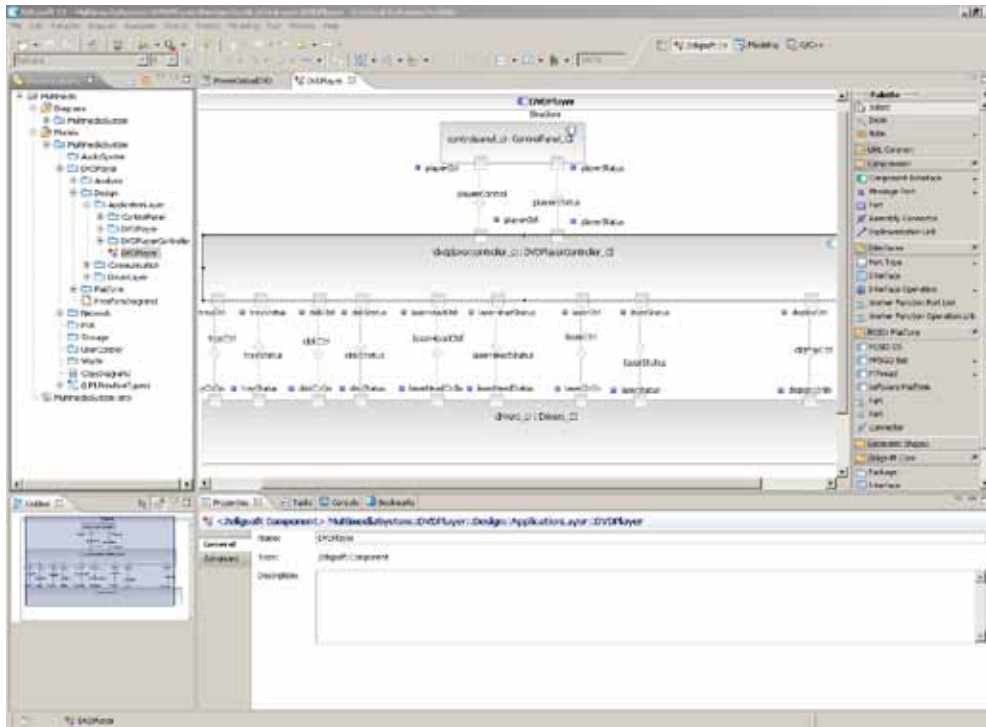
Founded on Zeligsoft's Component Oriented Engineering (COE) methodology, Zeligsoft CX is an adaptive, non-prescriptive and easy to use development toolkit that dramatically and measurably improves productivity. Combined with Zeligsoft's domain specializations and professional services, Zeligsoft CX offers a breakthrough solution for developers, architects, managers and integrators under increasing pressure to...deliver better products...faster.

DataSheet

### Component Oriented Engineering Methodology

The Zeligsoft COE vision and methodology represents a significant evolution of component-based model driven development approaches and was motivated by one overriding goal: dramatic improvements in software development productivity.

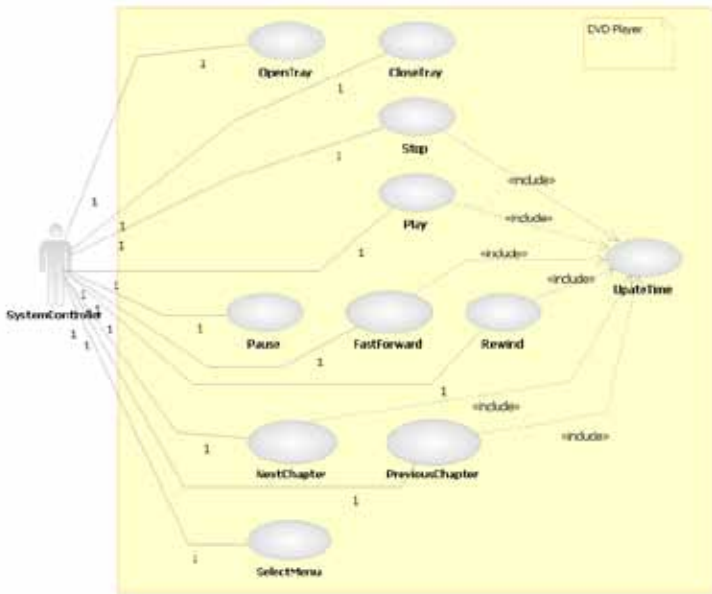
With COE, development teams can leverage domain-specific concepts and translations in order to more rapidly develop higher quality software without compromising application performance. COE is more open and customizable than conventional methodologies, and it enables the tailoring of development models, the model compiler, and analysis tools — all in support of measurable productivity gains.



Zeligsoft CX in the Eclipse Workbench

# Zeligsoft CX

Zeligsoft CX is a powerful, ready to use out-of-the-box toolkit that comes bundled with embedded system domain specializations plus integration with the IBM/Rational RSM tool. CX offers openness and user control via its standards-based architecture and customizable domain specializations that has not been available in the industry before. CX facilitates unprecedented flexibility and freedom to tailor the modeling environment and application performance to the needs of the development team.



Use case diagram

## Zeligsoft CX in your Development Process

### Design

Zeligsoft CX enables designers to model using their problem domain concepts, concepts that your developers use when reasoning about the system under development. This raises the abstraction of your model from generic UML, or even class or file based implementation concepts, to provide for greater efficiency and increased understanding.

### Validate

A Zeligsoft CX model contains not just your software, but also models of your logical and physical platforms. The allocation of application software to logical and physical platform and quality-of-service constraints as latency, memory size and so forth can all be validated by Zeligsoft CX.



Sequence diagrams for an action

### Analyze

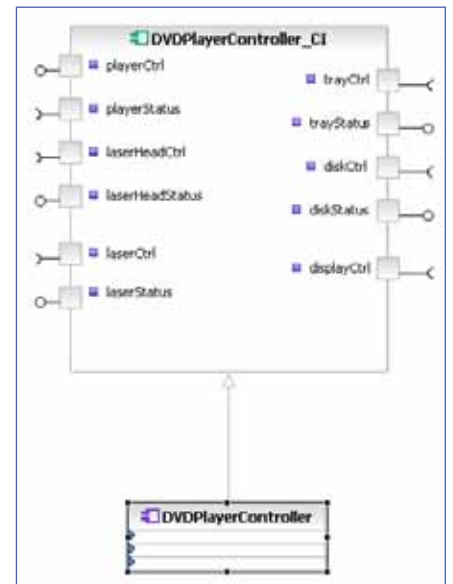
Your development team needs to plan for current software product lines as well as for future product and platform evolution. Zeligsoft CX provides the designer the tools to model this evolution and analyze the optimal path forward.

### Generate

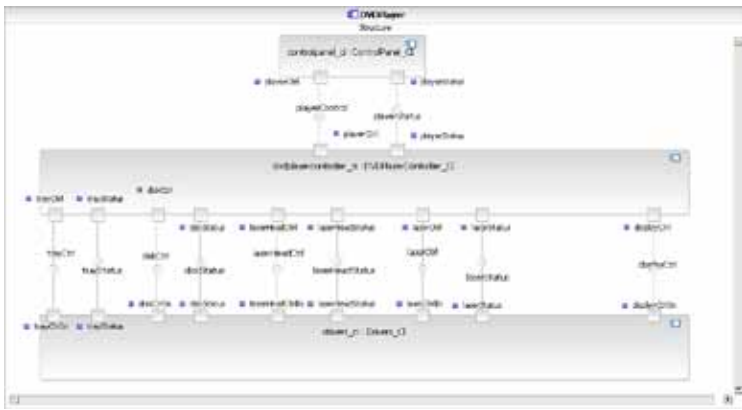
Model driven development will improve software developer productivity. It is also crucial to maintain these designs in code. Zeligsoft CX generates code with software, platform and allocation in mind. The CX deployment-aware generator understands the problem domain concepts and translates these into production quality code. The patterns used to do this are defined by the domain specializations that CX provides. The result: correct, efficient source code that is automatically generated according to your requirements.

### Test and Debug

Today's embedded system platforms are complex, multi-processor, multi-core and often heterogeneous. Zeligsoft CX allows you to visually describe them, develop software for them and then debug them visually as well. A single environment takes you from early design through development, culminating in distributed testing and debugging.



Component interface diagram



Internal structure of a component



Component with structure

## Zeligsoft CX Domain Specializations

Domains and domain specializations represent a central element of COE, and a cornerstone of the Zeligsoft CX toolkit. Domains are entities that encapsulate specific platform knowledge, component framework information and associated validation and transformation engines. Domains are used to complete the COE framework in order to provide an effective and efficient modeling and design solution. They provide the higher level concepts to build applications as well as the information and algorithms to support static analysis of designs and model compiler optimizations to ensure high-performing applications.

Domains can be quickly developed or adapted by Zeligsoft to accommodate:

- Standard component frameworks such as AUTOSAR, SCA, or CCM
- Proprietary architectures and frameworks
- Standard platforms such as POSIX
- Commercial software platforms such as the RTOS or Middleware used in an embedded system product
- Hardware platforms such as complex multi-processor System on Chip (SOC)
- Any other recurring design pattern in a problem or solution space.

Zeligsoft CX brings domain specializations to industry standard modeling and development environments, thus creating powerful domain specific language abstractions, as well as static analysis capabilities and model compiler optimizations.



Interfaces for ports

## Domain Specialization Examples

Abstraction of communication has been used in the past. People try to separate communication from functional logic through abstraction layers. Zeligsoft CX allows the user to model communication and delay choosing of particular communication mechanisms until integration time. Communication can be done through traditional function calling, RTOS messaging, inter-processing messaging or proprietary transports. Applications are modeled independently of the communication infrastructure. The generator adds these aspects in after integration time.

Design patterns define commonly-used constructs and provide guidance as to how to implement these constructs.

Zeligsoft CX provides out-of-the-box domain patterns and allows the user to specialize these or add to them.

Some examples of domain related patterns are:

- request, indication, confirmation pattern that are prevalent in the telecommunications industry
- Watchdog timers of safety critical systems
- Database access
- GUI integration
- Platform concepts such as services or busses

These design patterns can be added as first class citizens to the Zeligsoft CX toolset. This provides higher levels of abstraction for teams to design in. These models can then be validated for completeness and correctness, but they also provide input for the optimizing generator.

This means less code to write for the development team and less chances for errors, especially as these patterns are used often and are very repetitive.

Validation and generation of domain concepts can save 40-60% of development effort.

## Zeligsoft CX Services

Zeligsoft's professional services are delivered by a team of experts including embedded software engineers, system modeling experts, methodologists, domain experts, and UML and Eclipse tooling experts.

Zeligsoft offers a range of consulting, design and development services to help organizations leverage COE and the state-of-the-art CX tool. These services include:

- Training in Model Driven Development and Component-Oriented Engineering
- Training on how to effectively use the CX tooling.
- Training on effective product development with CX domain specialization
- Mentoring on the system and software modeling of customer applications

- Design harvesting with COE and CX, focused on practical reuse and componentization that is intended to shorten the development interval and costs of a new product, or variants, while at the same time enabling COE benefits with future development and maintenance
- Performance engineering