

# SmartComponent Library

by **Consultingwerk**  
software architecture and development

**Mike Fechner**  
Director





A group of eleven people, ten men and one woman, are standing outdoors in front of a modern building with large glass windows. They are all smiling and holding a large, light blue banner that spans across the front of the group. The banner has a subtle grid pattern and features the company name and services in white text. The man on the far right is wearing a dark hat. The woman in the center is wearing a dark top, while the others are wearing light blue shirts. The background shows green trees and a clear sky.

# Consultingwerk

software architecture and development



## Consultingwerk Software Services Ltd.

- Independent IT consulting organization
- Focusing on **OpenEdge** and **related technology**
- Located in Cologne, Germany, subsidiaries in UK and Romania
- Customers in Europe, North America, Australia and South Africa
- Vendor of developer tools and consulting services
- Specialized in GUI for .NET, Angular, OO, Software Architecture, Application Integration
- Experts in OpenEdge Application Modernization



## Mike Fechner

- Director, Lead Modernization Architect and Product Manager of the SmartComponent Library and WinKit
- Specialized on object oriented design, software architecture, desktop user interfaces and web technologies
- 28 years of Progress experience (V5 ... OE11)
- Active member of the OpenEdge community
- Frequent speaker at OpenEdge related conferences around the world





10  
Anniversary

# Agenda

- **Overview**
- Framework Backend Architecture
- OpenEdge GUI for .NET Frontends
- Kendo UI and Angular Frontends
- NativeScript Clients
- Application Modernization



## SmartComponent Library

- Developer Framework aimed to increase Developer productivity and flexibility
- Reduce or avoid repeating tasks
  - Tools (code generation and round-trip dev.)
  - Integration with Progress tools (OpenEdge, Telerik, KUIB, BPM, Corticon, ...)
  - Application Framework
- Allow integration with existing Applications and Frameworks (3<sup>rd</sup> party or home grown)
- Allow usage of individual framework components as needed (not all or nothing)



## SmartComponent Library

- “Eat your own dog food“
- Most of our tools are written using our own libraries and tools, 99.9% ABL code
- Full source code shipped to customers
- Weekly incremental releases (45 releases/year)
- Technical support
- Support for new OpenEdge releases in no longer than 30 days

## SmartComponent Library

- Support for new OpenEdge releases in no longer than 30 days
  - OpenEdge 11.7.4 testing started two weeks ago
- Preparing release of customized PASOE Docker Image following Progress' release of OpenEdge 11.7.4



# Application Framework Features

- Authentication, including client-principal support and multi-tenancy
- Flexible authorization (menu, toolbar, business logic, custom tokens, ...), can be used for data-related authorization (e.g. Regions)
- Localization (full UI translation), messages, data
- Definition based referential integrity
- Batch scheduler (repeating, just once, run now)
- Enhanced Unit testing framework
- ...

# Agenda

- Overview
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## Backend Overview

- The SmartComponent Library provides a flexible OERA Backend Architecture
- OpenEdge Reference Architecture
- Business Entities, Data Access Objects are a key component
- Business Tasks, including support for scheduled and async processing
- Common Infrastructure Components, Services

# Common Component Specification

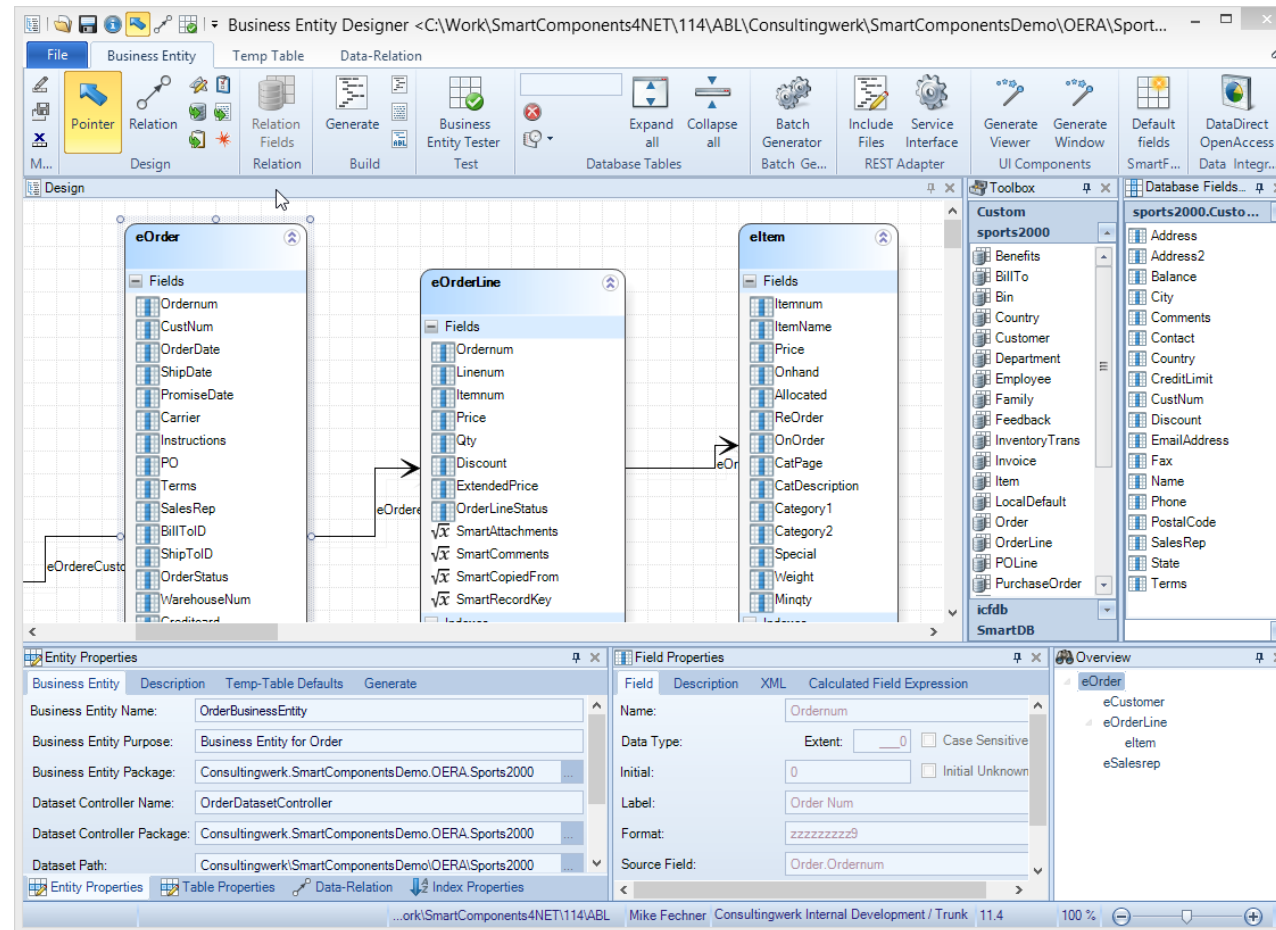
- Goal is to define **common understanding** and **architectural patterns** to allow **interoperability** of **framework components** from different vendors
- Consultingwerk founding member of CCS
- Team leader of Business Entity spec-team
- Containing the term „Component“ in the product name since 9 years – since product launch
- Framework was designed to allow interoperability with 3rd party components
- Framework fully compatible with CCS-ARCH1, CCS-SSS and CCS-BE specs (released in December 2016)



## Business Logic Design Process

- Template based, Visual Design using Diagrams
- Flexible source code generator
  - Customizable templates
  - Customizable code generator (ABL class)
- Plugin Infrastructure (integrate your own ABL code)
  - Influence automatic naming and design process
  - Add and enhance code generation
- Query custom repositories during design phase
- Ad-hoc based Business Entity Test utility

# SmartComponent Library





## Demo

- Build Customer Business Entity
  - Validation
  - Calculated Field
- Business Entity Tester
- Use DatasetModel to access Business Entity

# RESTful

- Standard RESTful interfaces build into framework
- No custom code required
- Web Developer friendly
- Foundation for API based economy
- Support smart devices like Google Home and Amazon Echo
- Swagger based API documentation



## Demo

- Enable RESTful access to Customer Business Entity
- <http://localhost:8820/web/Entities/DemoCustomers>
- Implement RESTful Business Task method
- <http://localhost:8820/web/Entities/DemoCustomers/1/remainingCredit>



## SmartFramework ERD Designer

- Available since 11/2017
- Based on Zamloxis ERD
- Integration with SmartFramework backend through customized version of Zamloxis ERD

11.7 LOCAL - SmartFramework ERD Designer - platform/resource/ABL\_117\_64/sports2000.smfdia#\_u-NAL\_3EeelBt7hYP3lg - Progress Developer Studio

File Edit Navigate Search Project Run Window Help

Quick Access OpenEdge Editor Planning Debug OpenEdge Server SmartFramework ERD Designer <no task active>

Project Explorer Outline

sports2000.smfdia \*sports2000.smfdia#Customer

Customer Subject Area

Customer

- CustNum INTEGER
- Name CHARACTER
- Address CHARACTER
- Address2 CHARACTER
- City CHARACTER
- State CHARACTER
- Country CHARACTER
- Phone CHARACTER
- Contact CHARACTER
- SalesRep CHARACTER
- Comments CHARACTER
- CreditLimit DECIMAL
- Balance DECIMAL
- Terms CHARACTER
- Discount INTEGER
- PostalCode CHARACTER
- Fax CHARACTER
- EmailAddress CHARACTER
- CustNum

Salesrep

- RepName CHARACTER
- Region CHARACTER
- SalesRep CHARACTER
- MonthQuota INTEGER
- SmallImage BLOB
- LargeImage BLOB
- Email CHARACTER
- PhoneOffice CHARACTER
- PhonePrivate CHARACTER
- PhoneMobile CHARACTER
- SalesRep

Order

- Ordernum INTEGER
- CustNum INTEGER
- OrderDate DATE
- ShipDate DATE
- PromiseDate DATE
- Carrier CHARACTER

fk\_Salesrep\_Customer 1..\*

fk\_Salesrep\_Order 1..\*

fk\_Customer\_Order 1..\*

Table

Core

Property Value

Label

Replication

Triggers CREATE: sports2000trgs/crcust.p, DELETE

SmartFramework

- Allow Attachments false
- Allow Comments false
- Description Fields CustNum
- Description Fields Substitute
- Key Field Assignment
- Temp Table Name
- Unique Fields

Related Tables View

Name	Parent	Child	Cardinality	Field map
fk_Country_Customer	Country	Customer	1..*	[Country -> Country]
fk_Customer_BillTo	Customer	BillTo	1..*	[CustNum -> CustNum]
fk_Customer_Invoice	Customer	Invoice	1..*	[CustNum -> CustNum]
fk_Customer_Order	Customer	Order	1..*	[CustNum -> CustNum]
fk_Customer_RefCall	Customer	RefCall	1..*	[CustNum -> CustNum]
fk_Customer_ShipTo	Customer	ShipTo	1..*	[CustNum -> CustNum]
fk_Salesrep_Customer	Salesrep	Customer	1..*	[SalesRep -> SalesRep]
fk_State_Customer	State	Customer	1..*	[State -> State]

358M of 781M

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20:12 02.11.2017

## Demo

- Import Sports2000 Schema into ERD
- Import Relation Definition from SmartFramework backend



# Agenda

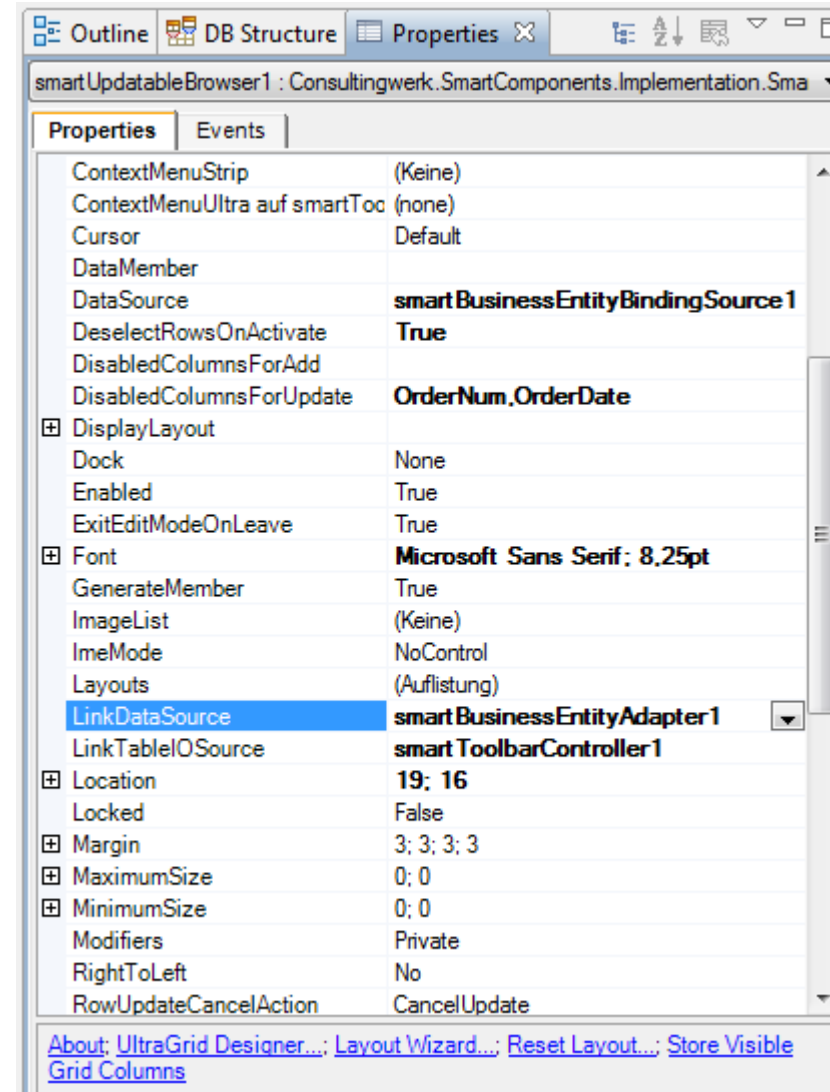
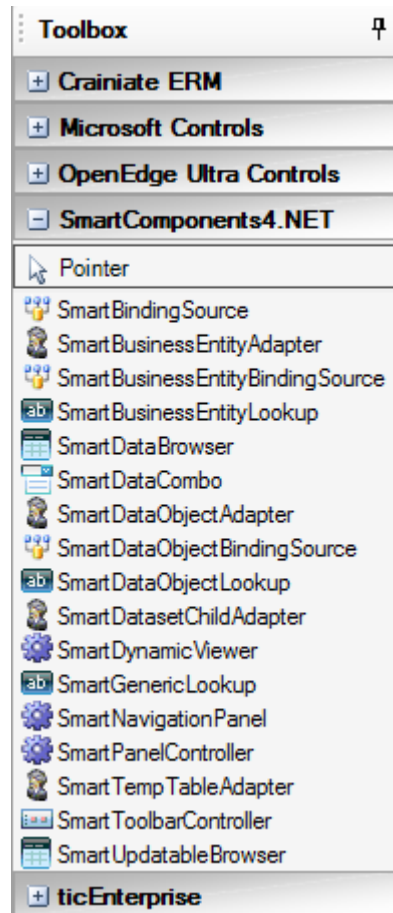
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## User Interface Design Process

- Screen design based on rich foundation classes
- Compose Forms by adding rich SmartComponents and standard .NET Controls
- Connect and parameterize SmartComponents using property grid and Wizards
- Data centric design process: Achieving UI Design productivity similar to the AppBuilder

# User Interface Design Process





## Demo

- Use Business Entity Designer to generate UI
- Open in Visual Designer
- Add Salesrep Lookup in Visual Designer

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## Support for JSDO Based Clients

- SmartComponent Library Backend and

**JSDO based consumers: Telerik Mobile, Kendo UI, Kendo UI Builder, ... = perfect match!**

- Full support for complete JSDO functionality

**JSDO**  **Consultingwerk**  
likes this.



## Support for Progress/Telerik Mobile

- Generic REST Service Interface for JSDO based clients
  - Full CRUD support
  - Invoke Methods
  - Invoke Business Tasks
- No need to redeploy new REST application for every single application
- Direct access to any Business Entity or Business Task that the current user is authorized for

## Generic REST Service Interface for JSDO

- Simplified deployment
- PASOE (Progress AppServer) or Classic AppServer
- Web Handlers (OpenEdge 11.6, 11.7), PASOE preferred
- REST Adapter (OpenEdge 11.5, Classic AppServer supported)
- Single developer AND large teams
- Translation of Data Catalog and Authorization (e.g. Field level access)

## Recorded Demo Telerik Mobile Platform

- Create a new hybrid mobile project in Telerik Mobile platform using Wizard
- Add access to SalesRep Business Entity
- Leverage same Business Entity in Web and Desktop
- Recorded version of the demo: <https://www.youtube.com/watch?v=m-63Wzpj9c>



# SmartComponents.Web2



**Kendo UI**  
THE ART OF WEB DEVELOPMENT



## SmartComponents.Web2

- Angular is a MVVM framework for browser based applications
- Binding Data to UI Elements
- Separate Data, View and Code
- Kendo UI provides UI components for Angular
- SmartComponents.Web2 implements similar programming model as in GUI for .NET
- Configurable data sources and communication between UI components

# Screen Definition based on functional components

```

<div ng-controller="simpleCtrl" style="background-color: white;">
  <h1>Salesreps</h1>

  <div class="row">
    <div class="col-md-28">

      <smart-data-source
        smart-object-name='salesrepDataSource'
        smart-business-entity-name="Consultingwerk.SmartComponentsDemo.OERA.Sports2000.SalesRepBusinessEntity"
        smart-entity-table="eSalesrep"></smart-data-source>
      <smart-grid
        smart-object-name='salesrepGrid'
        smart-data-source='salesrepDataSource'
        smart-grid-layout='Consultingwerk.SmartComponentsDemo.OERA.Sports2000.SalesRepBusinessEntity/salesrep'></smart-grid>

    </div>

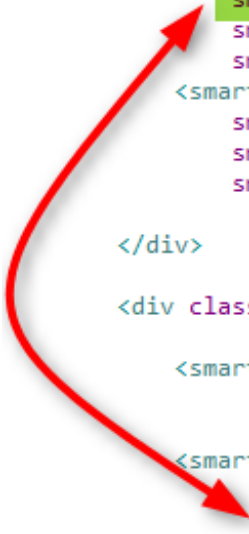
    <div class="col-md-20">

      <smart-toolbar
        smart-object-name='salesrepToolbar'></smart-toolbar>

      <smart-viewer
        smart-object-name='salesrepViewer'
        smart-data-source='salesrepDataSource'
        smart-tableio-source='salesrepToolbar'
        smart-viewer-layout='Consultingwerk.SmartComponentsDemo.OERA.Sports2000.SalesRepBusinessEntity/salesrep'></smart-viewer>

    </div>
  </div>
</div>

```





## Demo

- SmartComponents.NG2 sample application
- Screen definition in Repository Tooling



**Kendo UI**  
THE ART OF WEB DEVELOPMENT

## SmartComponents.Web2

- Initially Based on Angular JS 1 (JavaScript)
- Rewritten in Angular 2 (November 2016 – September 2017)
- Complete rewrite in TypeScript as a OO solution
- Leveraging communication protocols known from SmartComponent Library for GUI for .NET

# Agenda

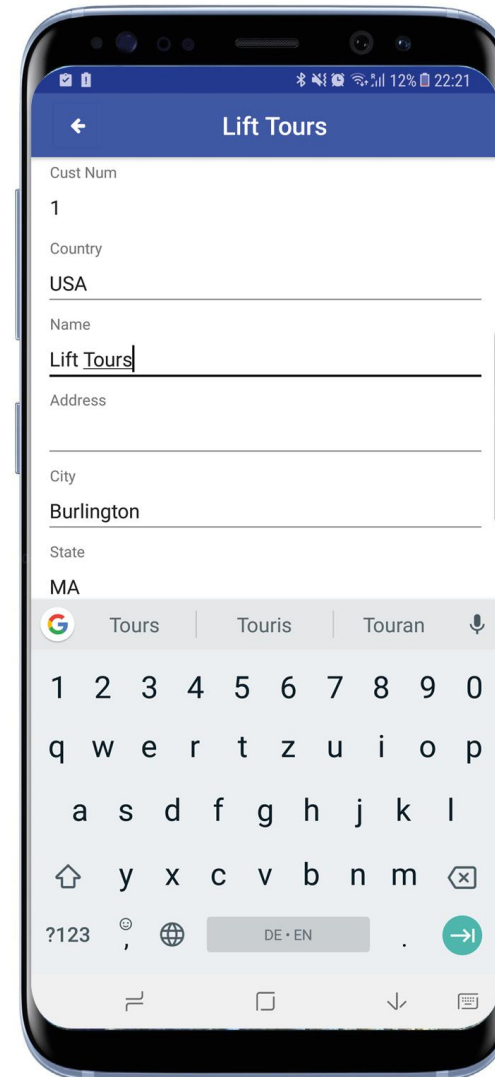
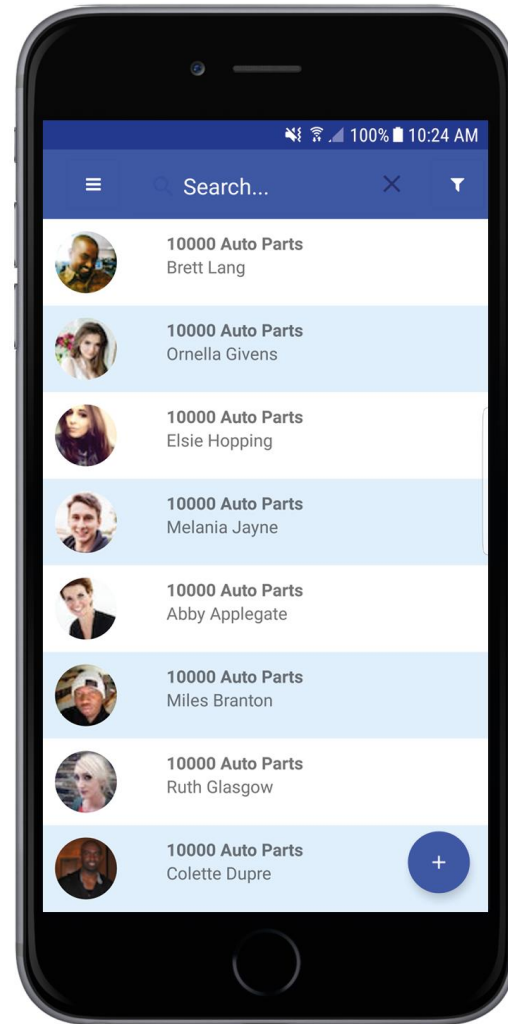
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# NativeScript

- Native mobile applications for iOS and Android
- JavaScript or TypeScript based
- Standard for Angular based mobile applications
- Allows us to reuse parts of SmartComponents.NG2 on mobile
- Similar developer experience for customers
- Similar component architecture
  - Data sources, grids, viewer, lookups, ...



## Kinvey mBaaS Adapter

- SmartComponents for NativeScript include a Kinvey Adapter
- Leverage cloud based hosted backend services
- Support caching, asynchronous updates and conflict resolution
- Based on JSDO support in the JSDO

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## SmartComponent Library and WinKit

- ***SmartComponent Library*** and ***WinKit*** are part of our GUI for .NET adoption and migration strategy
  - WinKit: Enhancement of existing screens
  - SmartComponent Library: New functionality
- Shared framework foundation classes
- Compatible directory and project structure
- Used side by side in customer projects
- Over 45 different WinKit implementations already
- WinKit included in SmartComponent Library

**Order Maintenance**

File Navigate Maintenance View

Order Num: 1      Ordered: 23/01/09

Order Status:

Shipped: 28/01/2009

Promised: 28/01/09

Cust Num: 53      Name: Offside Hockey

Carrier: FlyByNight Courier      Terms: Net30      PO:

Orderlines       Customer Detail

OrderLines

Line Num	Item Num	Item Name	Qty	Price	Extende
1	54	Canoe	30	4,86	
2	55	Surfboard	21	23,85	
3	53	Swimming Trunks	75	8,77	
4	28	Ski Gloves	39	23,00	
5	39	Baseball	75	34,00	2.
6	26	Catchers Mit	28	4,99	

Line Num: 1

Item Num: 54

Item Name: Canoe

Price: 4,86

Qty: 30    Extended Price: 131,22

Discount: 10%

Order Line Status:

Handle with care

Order Maintenance - Redesigned

File Start Options

Navigation: First, Prev, Next, Last

Search: Search

Maintenance: Edit, Save, Delete, Cancel

Order Num: 1      Ordered: 23/01/09

Order Status: Shipped

Shipped: 28/01/2009

Promised: 28/01/09

Cust Num: 53      Name: Offside Hockey

Carrier: FlyByNight Courier      Terms: Net30      PO:

Handle with care

Orderlines      Customer Detail

Legen Sie eine Spalte hier ab, um nach dieser zu gruppieren.

Line Num	Item Num	Item Name	Qty	Price	Ext
1	54	Canoe	30	4,86	
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Order Line Status: Shipped

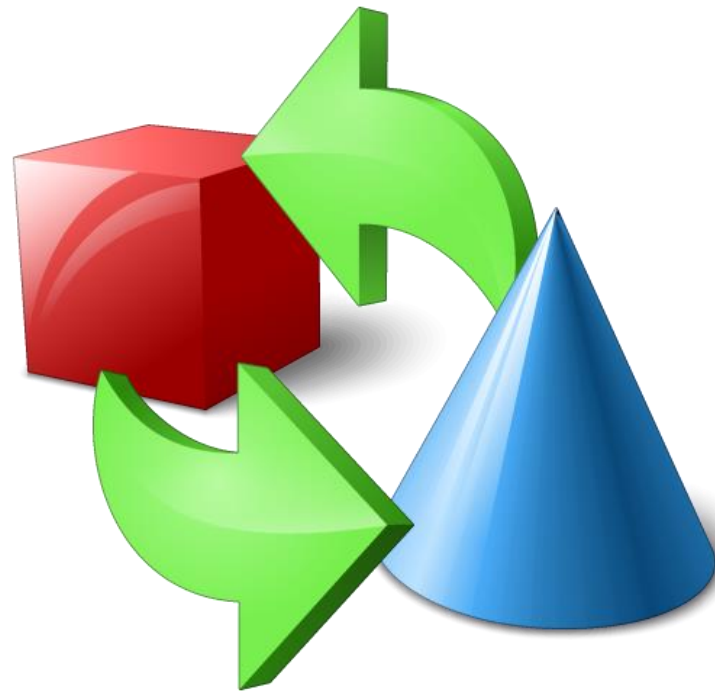
## Migration and Modernization options

- **Enhance and extend existing applications**
- SmartComponent Library integrates with existing applications and frameworks
- SmartComponent Library functionality can be accessed from existing code
- SmartComponent Library can access existing code, typically of any kind
  - direct execution or through adapters
  - custom service or component implementations
  - Don't worry about SHARED VARIABLES etc...



## Alternative

- Migration of existing Applications

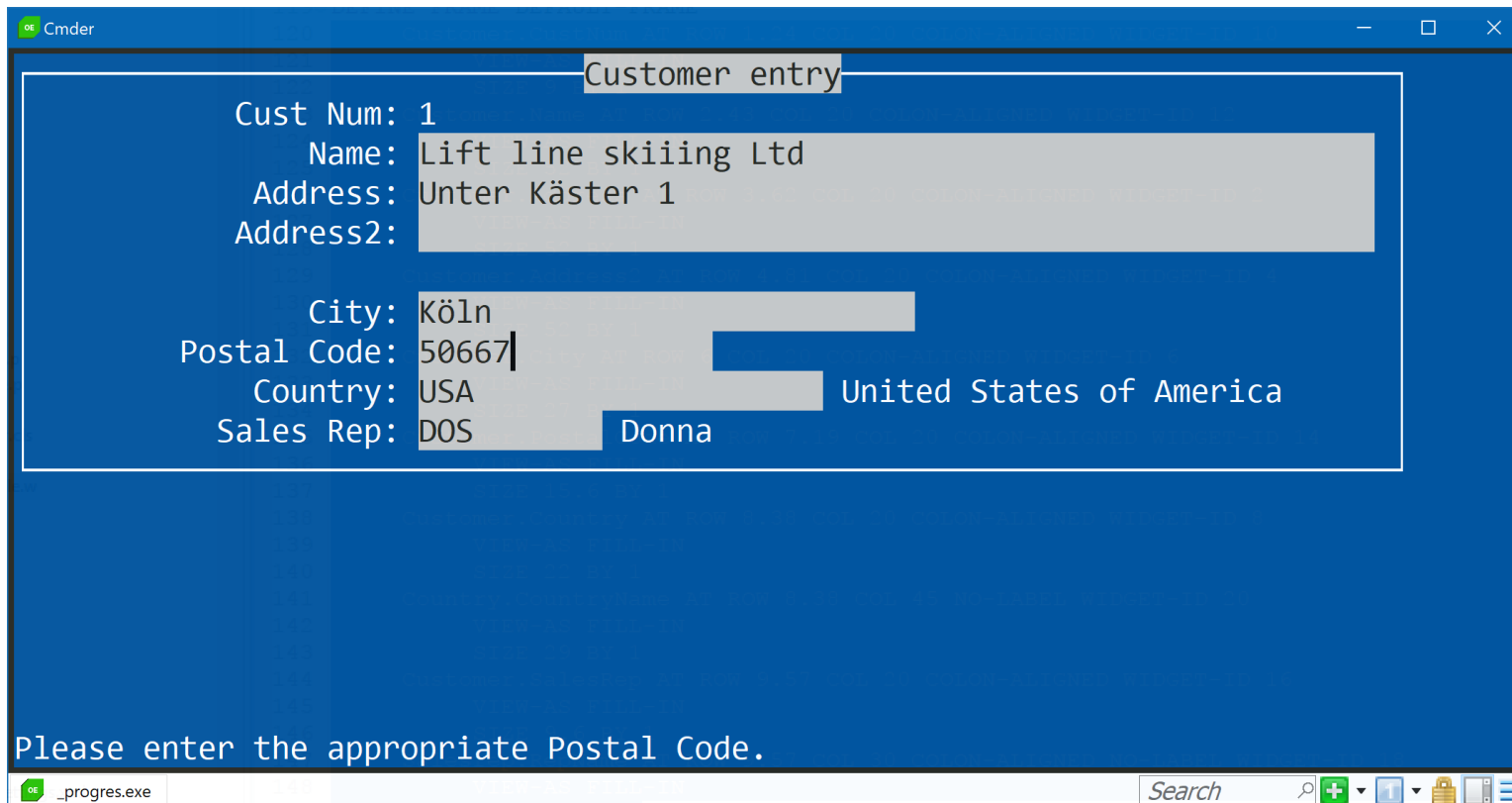


## Migration and Modernization options

- Semi-automated Migration of source code
- Options vary based on current code
- Strong usage of Proparse for analyzing source code, importing into Business Entity Designer
- Refactoring tooling based on Proparse
- Migration of any kind of applications
  - custom
  - ADM1, ADM2 or Dynamics
- Template based migration of UI components
- API for ABL Widget abstraction

## Demo

- Migration of TTY style application with UPDATE EDITING Block



The screenshot shows a Windows Command Prompt window titled "Cmder" with a blue background. The application interface is titled "Customer entry" and displays the following fields:

```
Cust Num: 1
Name: Lift line skiing Ltd
Address: Unter Käster 1
Address2:
City: Köln
Postal Code: 50667
Country: USA United States of America
Sales Rep: DOS Donna
```

At the bottom of the window, a message reads: "Please enter the appropriate Postal Code." The taskbar at the bottom shows the taskbar icon for "\_progres.exe" and a search bar.

## Demo

- Migration of ABL Browse Widget
  - Rewrite of Calculated Field
  - Creation of matching Business Entity
- Migration of ABL GUI for .NET Frame
  - Implement ABL Widget abstraction



# Questions



# Consultingwerk

software architecture and development