

Blaise 5 Architecture



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Overview

- ⌘ Runtime Architecture
- ⌘ Web Data Entry
- ⌘ Near future plans

Runtime architecture



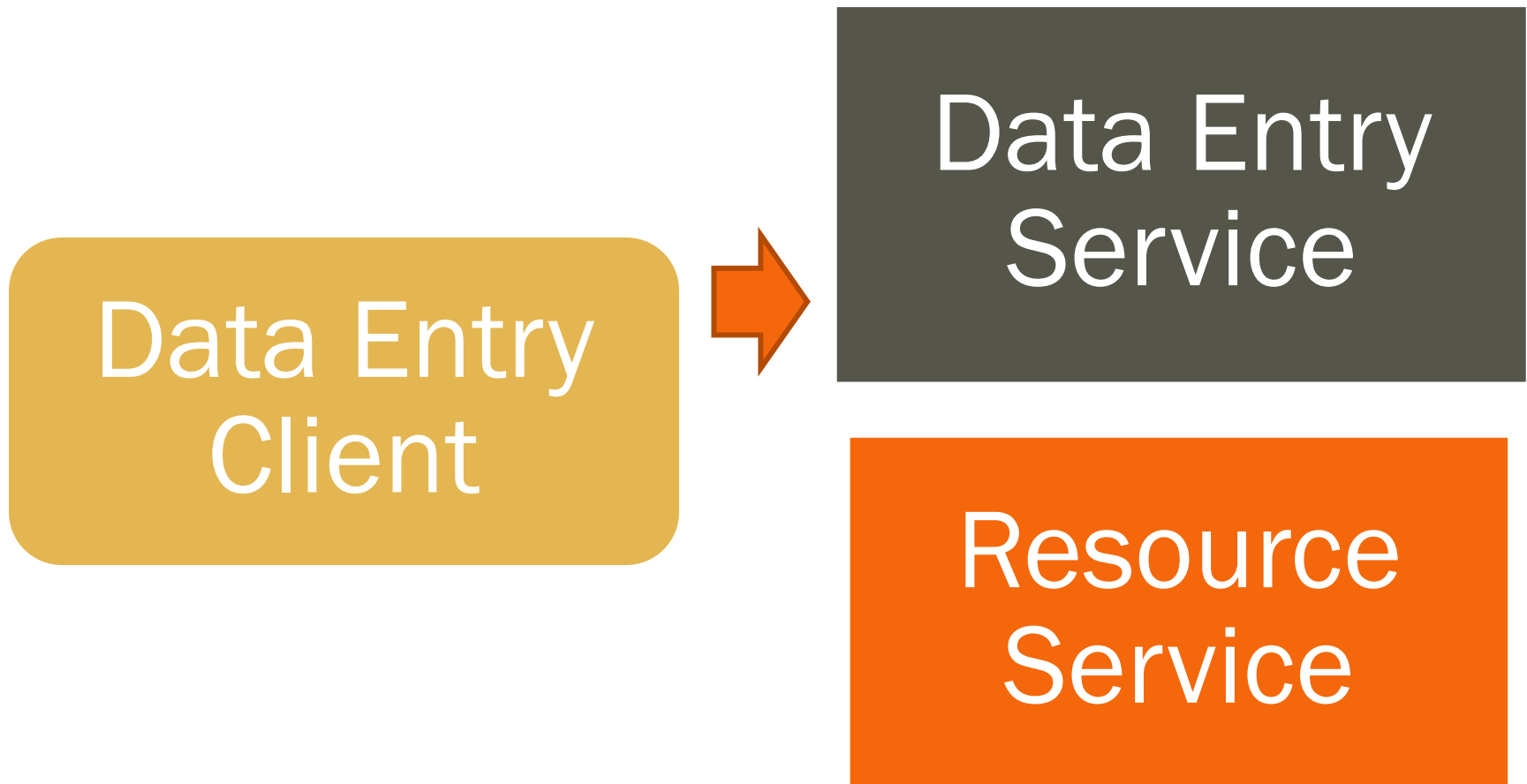
Blaise Runtime

- ☞ Designed for:
 - Concurrent use
 - Multi mode : Shared implementation
- ☞ Client-Server architecture
- ☞ Distributed execution:
 - Dedicated Blaise Servers
- ☞ Maximized machine independence
- ☞ Installed surveys

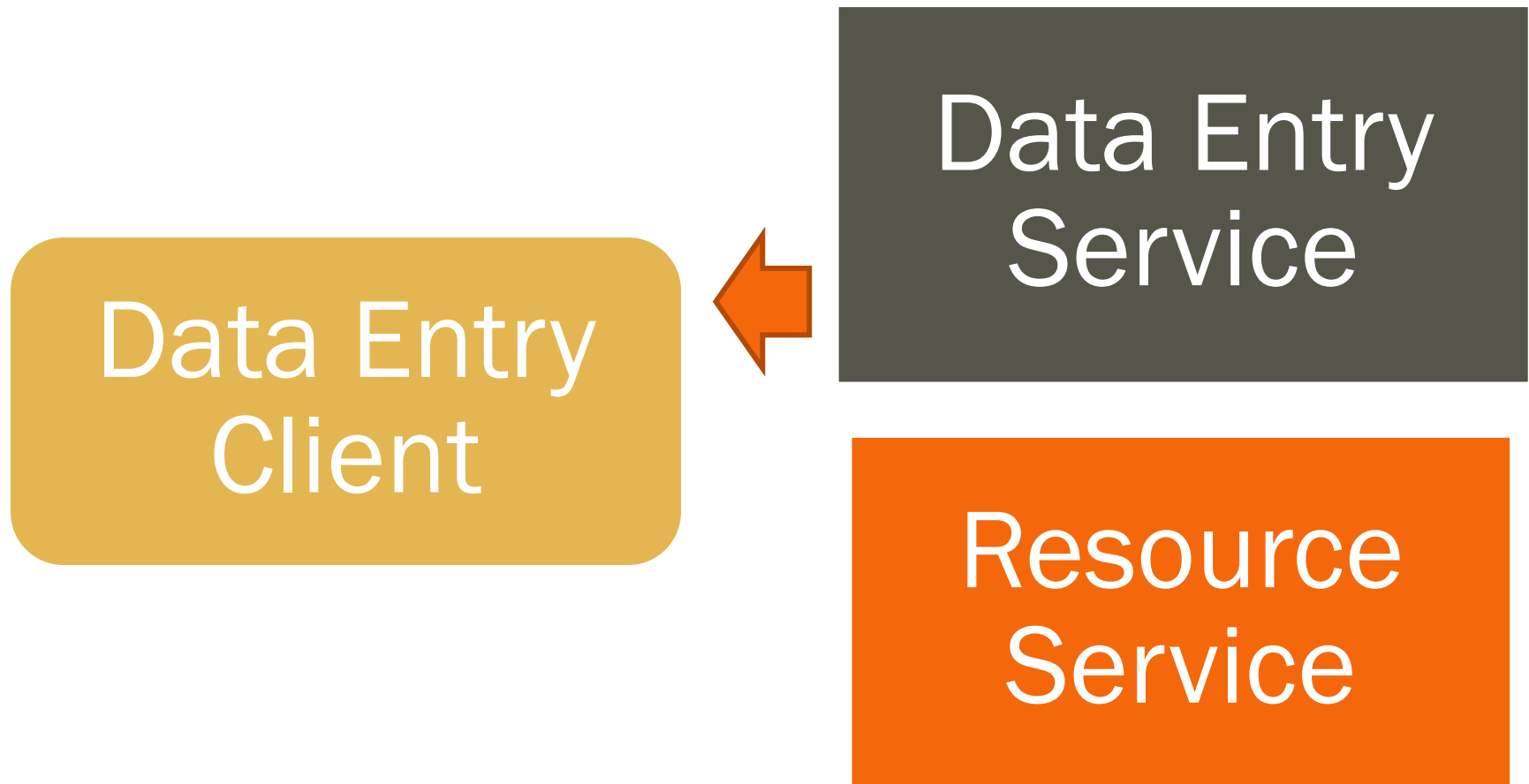
What is a Service?

- ∞ Software without visual User Interface
- ∞ Interaction only by Sending Messages:
 - Send Request to perform Task
 - Receive Response with Result
- ∞ Accessible:
 - on local machine
 - over Network or Internet
- ∞ Implementation is 'black box'

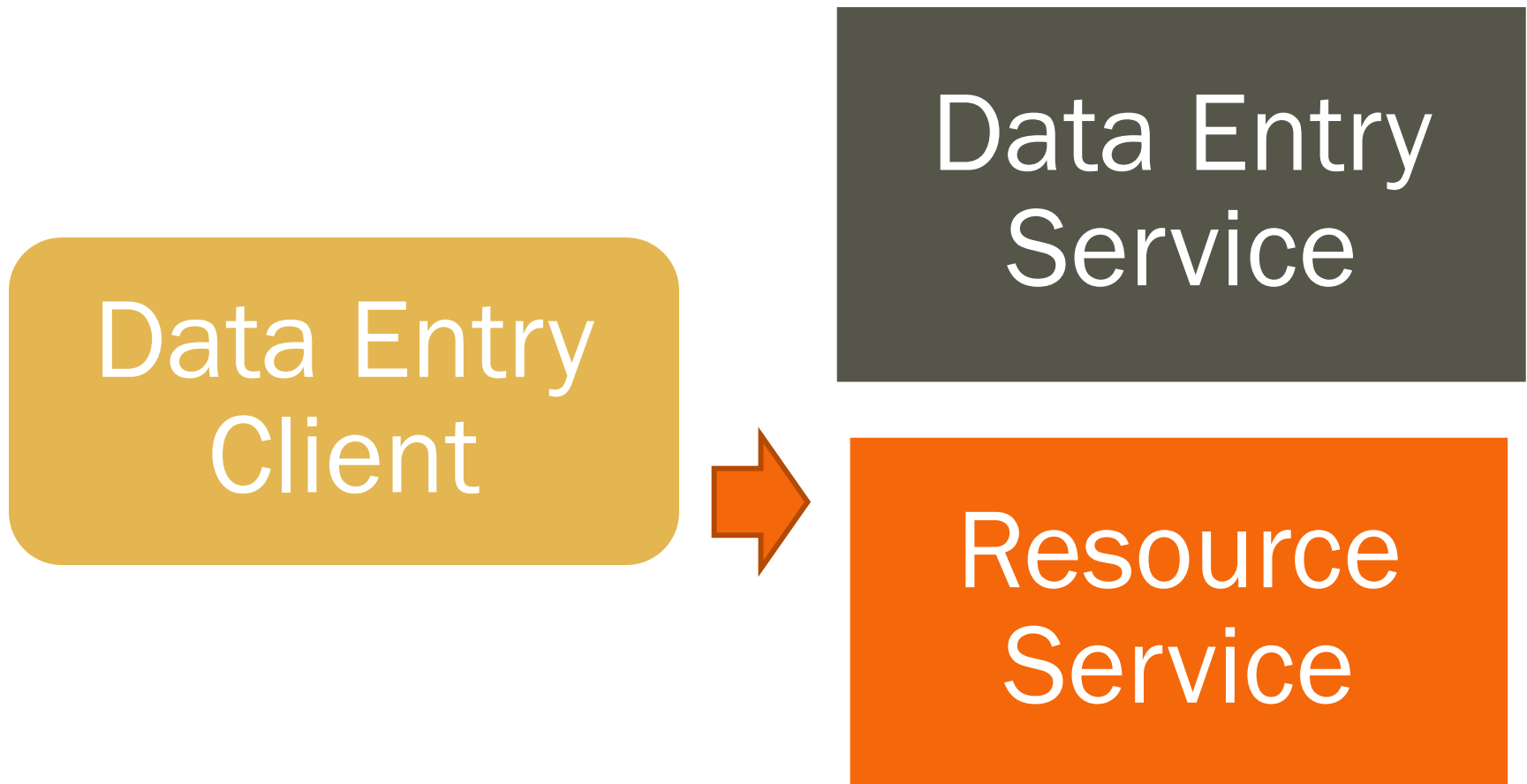
Client-Server Architecture



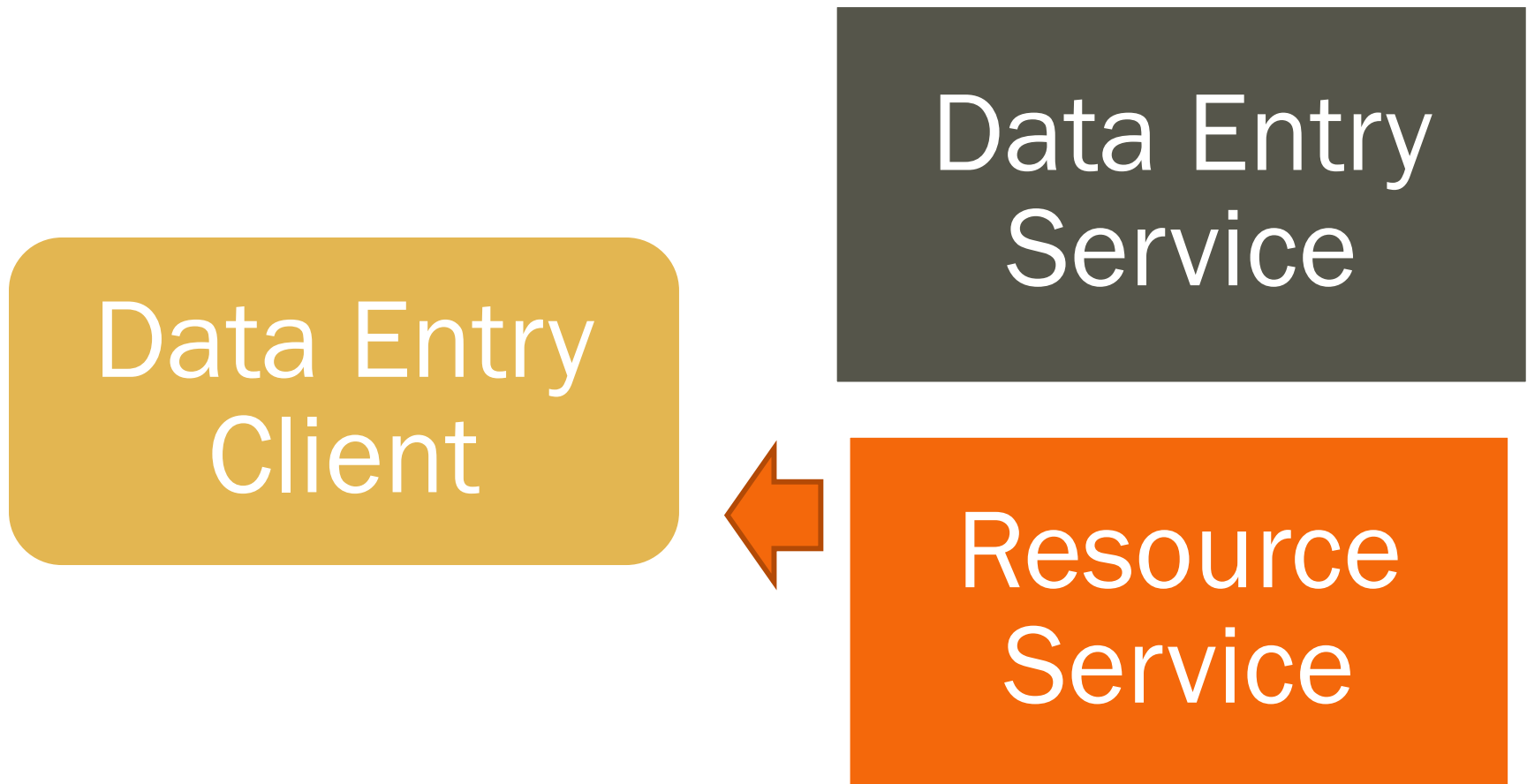
Client-Server Architecture



Client-Server Architecture



Client-Server Architecture



Data Entry Client

1. Renders Interview Page
2. Handles interaction with respondent:
 - Edit field values
 - Click on Control
3. Communicates with Data Entry Service
 - Sends data, receives new Page
4. Communicates with Resource Service:
 - Receives required User Interface elements

Data Entry Service

1. Retrieves Session Data
2. Processes Interview Data
3. Executes Rules
4. Executes Action
5. Gets new Page Definition
6. Enriches Page with actual Data
7. Updates Interview State

Resource Service

- ✎ Provides requested User Interface elements:
 - Templates
 - Media elements (images)
 - Font Definitions
 - Translatable System Texts
 - Styles

Blaise Runtime

☞ Service-Oriented Architecture (SOA):

- Loose Coupling
- Interface specifies functionality
- Communication via Messages:
 - Standard protocols
- Stateless

☞ Advantages:

- Concurrent use
- Distributed execution

Blaise Runtime Services

- ☞ Data Entry Service:
 - Hosts Interview Sessions
- ☞ Data Service:
 - Provides Access to Stored Data
- ☞ Resource Service:
 - Returns User Interface elements
- ☞ Web Service:
 - Returns files for web survey

Blaise Server Park

- ∞ Collection of Blaise Servers
- ∞ Blaise Server:
 - Hosts Blaise Runtime Service(s)
 - Role(s): Supported functionality
 - Deployed Instruments
- ∞ All Blaise Services must be hosted
- ∞ Minimal configuration: Single machine

Server Manager

- ☞ Define Server [Park](#):
 - Select machine
 - Specify hosted services
- ☞ Deploy instrument:
 - Create package from [solution](#)
- ☞ Security:
 - Authentication [required](#)
- ☞ Calls Deploy Service

Instrument Deployment

- ∞ For each Machine in Server Park:
- ∞ Register Instrument Id
- ∞ Copy required files to specified locations:
 - Prepared datamodel
 - Layout resources
 - External data

Sample Server Park

Web
Service

Web
Server

Data Entry
Service

Resource
Service

Data Entry
Server 1

Data Entry
Service

Resource
Service

Data Entry
Server 2

Data
Service

Data
Server

Load Balancer Service

- ∞ Distributes interview sessions over Servers of Park
- ∞ Returns address of:
 - Data Entry Service
 - Resource Service
- ∞ Called at Start of Interview Session
(by Data Entry Client)

DEP - Start Options

- ☞ Runtime parameters:
 - Data Entry Settings, Layout Set
 - Start Parallel
 - Key Value, Field [Values](#)
- ☞ Specify in Project [Options](#)
- ☞ Screen resolution detection
- ☞ Automatic language [selection](#) :
 - Specify culture

Rules Engine

∞ Design goals:

- Compatible with Blaise 4.x
 - Exception: correct flaws
- Run independent of machine (settings)

∞ Data Entry Settings:

- Influence [execution](#)

∞ Selective Checking Mechanism:

- Optimises performance

Expression Evaluation

- ✎ In Blaise 4.x: each expression always evaluates
- ✎ Advantage:
 - Executing rules is easy
- ✎ Disadvantage:
 - Correctness of results is sometimes questionable:
 - Example: progress information
- ✎ Blaise 5:
 - Optional alternative logic

Alternative Logic

- ☞ Allow result of expression to be ‘unknown’:
 - Non-response Field in expression
- ☞ Evaluated Expression:
 - Value
 - Status : (Correct, Unknown, Erroneous)
- ☞ IF Condition THEN ... ELSE ... ENDIF:
 - Condition: Unknown => No Branch is executed
- ☞ Warning: need to examine rules

Data Entry Performance

☞ Client-Server Architecture:

- Rules are executed on Server
- Support many concurrent interviews

☞ Single User on Single Machine:

- Overhead: Messaging, restoring Session Data
- Blaise 4.x: DEP executes rules itself
- Want similar efficient execution

Fat Data Entry Client

Data Entry
Client

Data Entry
Service

Resource
Service

Fat Data Entry Client

- ✎ Windows Data Entry Client:
 - Runtime option –*RunMode:FatClient*
 - Hosts implementations of Blaise Runtime Services
- ✎ Direct communication (method calls)
- ✎ Single user:
 - Fast execution of rules of complex Datamodel
 - Data Record persists in Memory

Web Data Entry

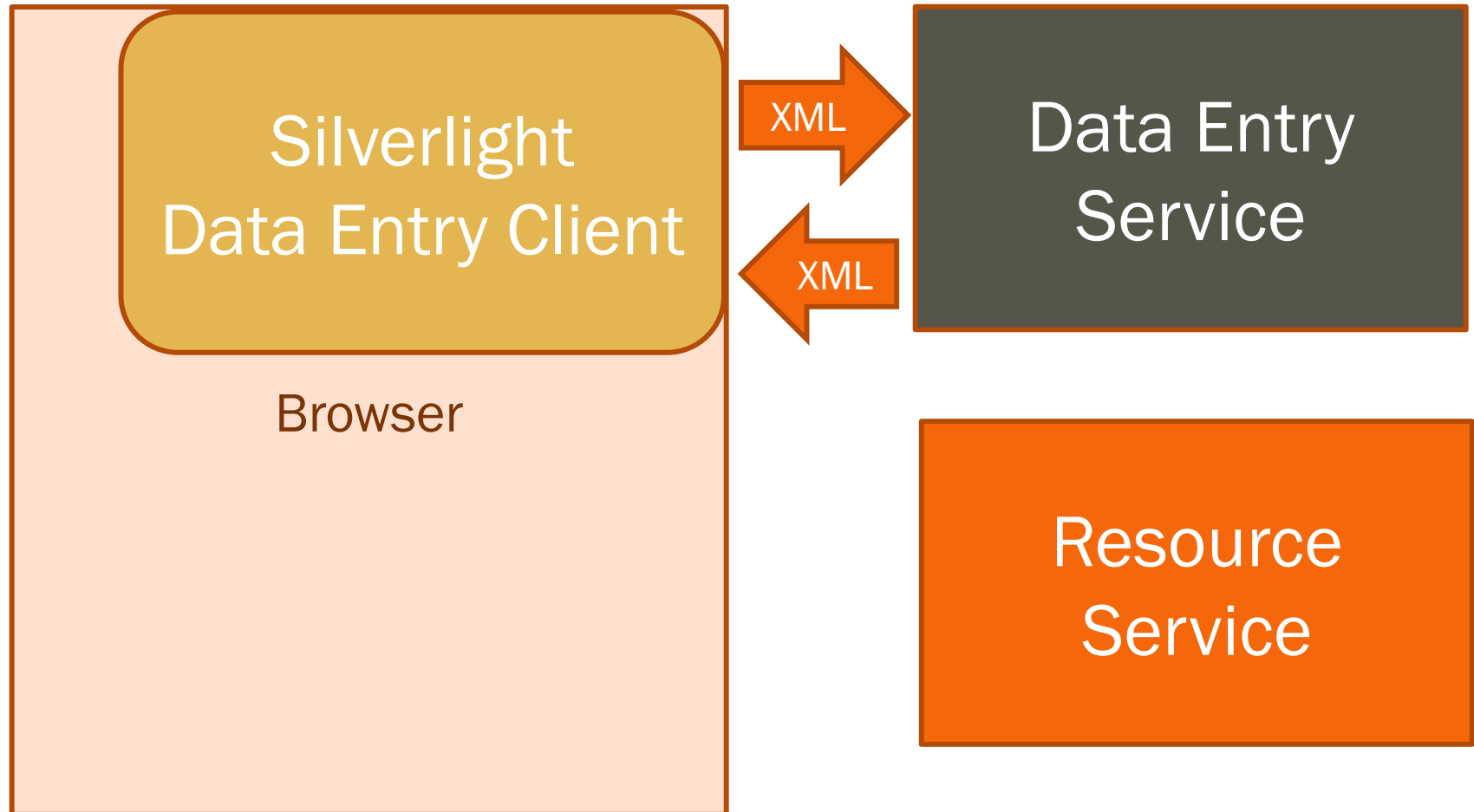


Blaise 5.0

Data Entry Client:

- Smart client
- Two versions:
 - Windows Data Entry Program
 - Silverlight Browser Plugin
- Page definition contains references to:
 - XAML templates
 - Media elements, Fonts, System Texts

Blaise 5.0 Web Data Entry



What is XAML?

Extensible Application Markup Language

- XML-based
- Define User Interface:
 - Controls
 - Events
 - Data binding
- Represent actual User Interface Objects
- Part of .Net Framework

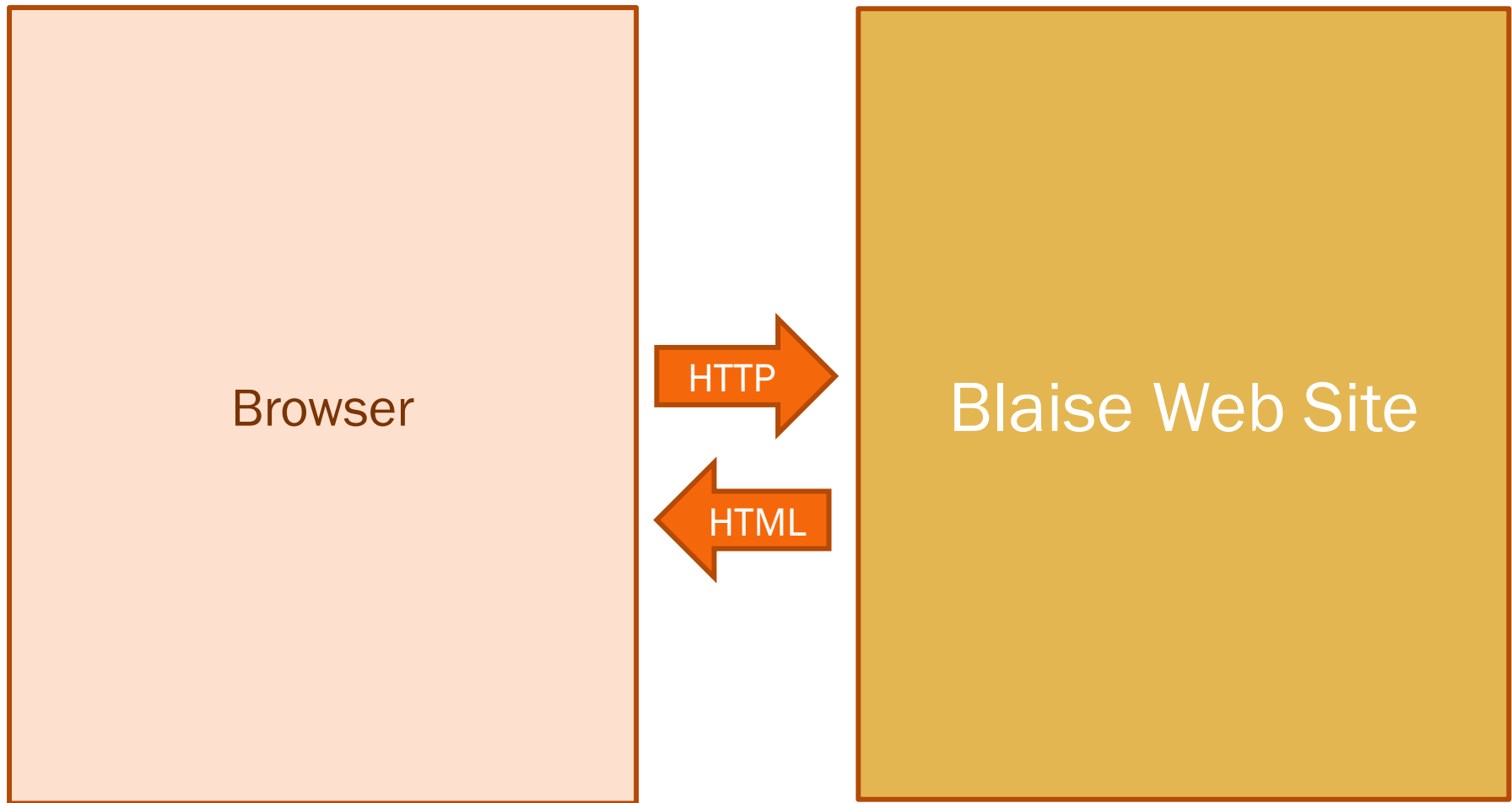
Sample XAML

```
<?xml version="1.0" encoding="utf-8" ?>  
- <Grid Name="LayoutRoot" Background="White">  
  <Button Content="Click Me!" Height="23" HorizontalAlignment="Left"  
    Margin="158,125,0,0" Name="button1" OnClick="ButtonClickedHandler"  
    VerticalAlignment="Top" Width="75" />  
</Grid>
```

Devices for Data Entry

- ☞ Tablets, smart phones
- ☞ Rapid technological innovations
- ☞ Many platforms:
 - Android, iOS (Apple) , Windows Phone
 - Not all [support](#) XAML
- ☞ Want Data Entry on these devices:
 - Need reliable lasting solution:
 - Basic Internet Data Entry (suited for all browsers)

Blaise 5.1 Web Data Entry



Rethink Layout

∞ Two options:

1. Translate current XAML definitions:

- Disadvantage: Unable to translate fancy concepts
- Advantage: Local change to runtime only

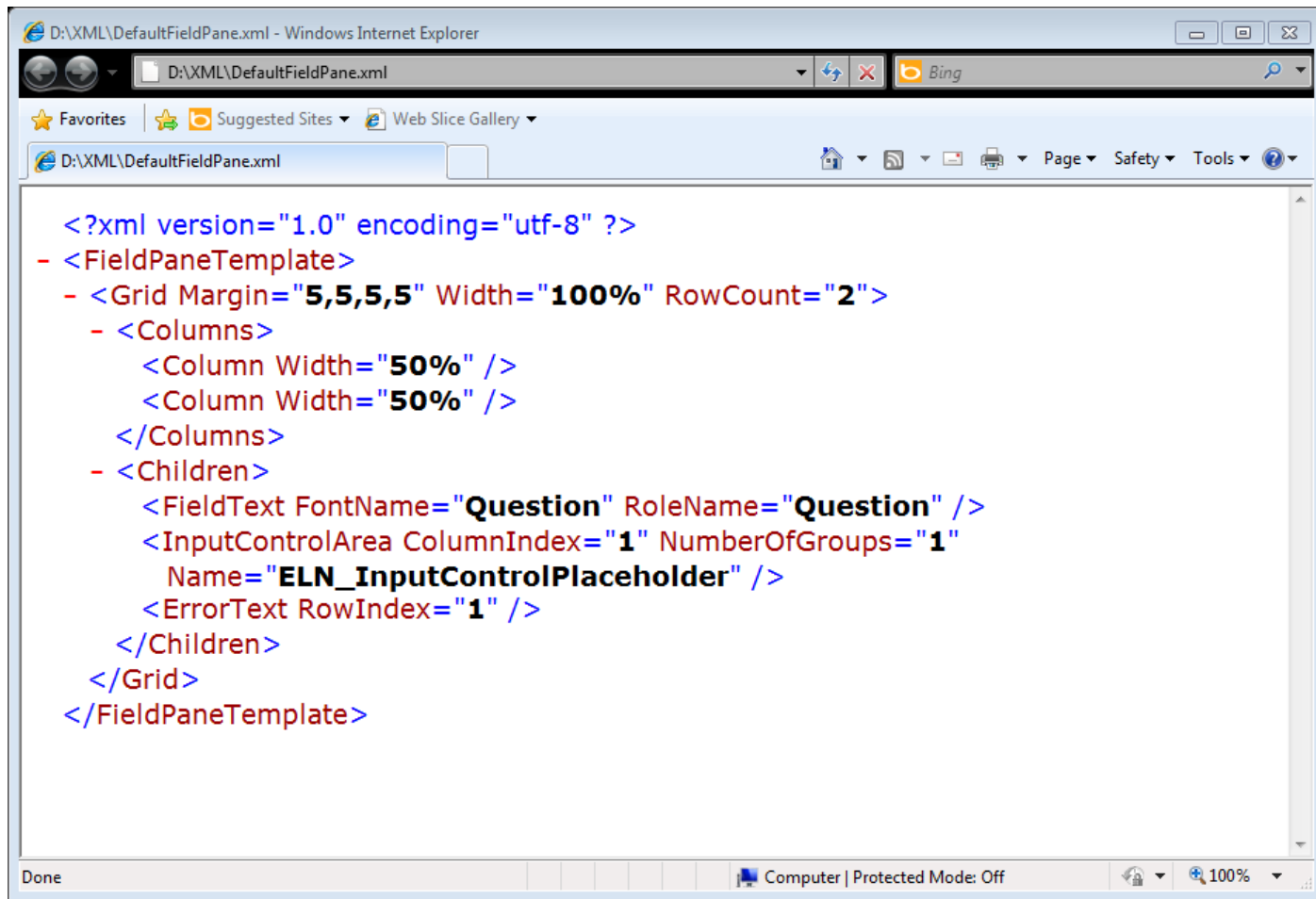
2. Use general Layout definitions:

- Disadvantage: Change involves Template designer, Resource Service
- Advantages:
 - Enables Blaise-specific customization
 - Straightforward translation

General Layout

- ✎ Own specification of User Interface elements:
 - Controls: InputControl, TextControl, Grid, ...
 - Layout Types: Color, Alignment, Unit, ...
- ✎ Templates:
 - Definition: Control
 - Applicability condition
- ✎ Objects with XML representation
- ✎ Only Specification, no rendering

Sample Template



```
<?xml version="1.0" encoding="utf-8" ?>
- <FieldPaneTemplate>
  - <Grid Margin="5,5,5,5" Width="100%" RowCount="2">
    - <Columns>
      <Column Width="50%" />
      <Column Width="50%" />
    </Columns>
    - <Children>
      <FieldText FontName="Question" RoleName="Question" />
      <InputControlArea ColumnIndex="1" NumberOfGroups="1"
        Name="ELN_InputControlPlaceholder" />
      <ErrorText RowIndex="1" />
    </Children>
  </Grid>
</FieldPaneTemplate>
```

Layout 5.1 - Work in Progress

- ☞ Define new Resource Database:
 - General templates
 - General styles
- ☞ Implement new Resource Service
- ☞ Define new page generation algorithm:
 - Use applicability condition
 - Apply default template defined by placeholder
- ☞ Renew Template Designer:
 - Define general layout
 - Render as XAML

Blaise 5.1 Data Entry Service

- ✎ Extends functionality of 5.0 Data Entry Service
 - Applies general templates
 - Translates and parses texts
 - Returns general page definition
- ✎ General Page Definition contains:
 - General controls
 - Parsed RichText elements
 - References to images

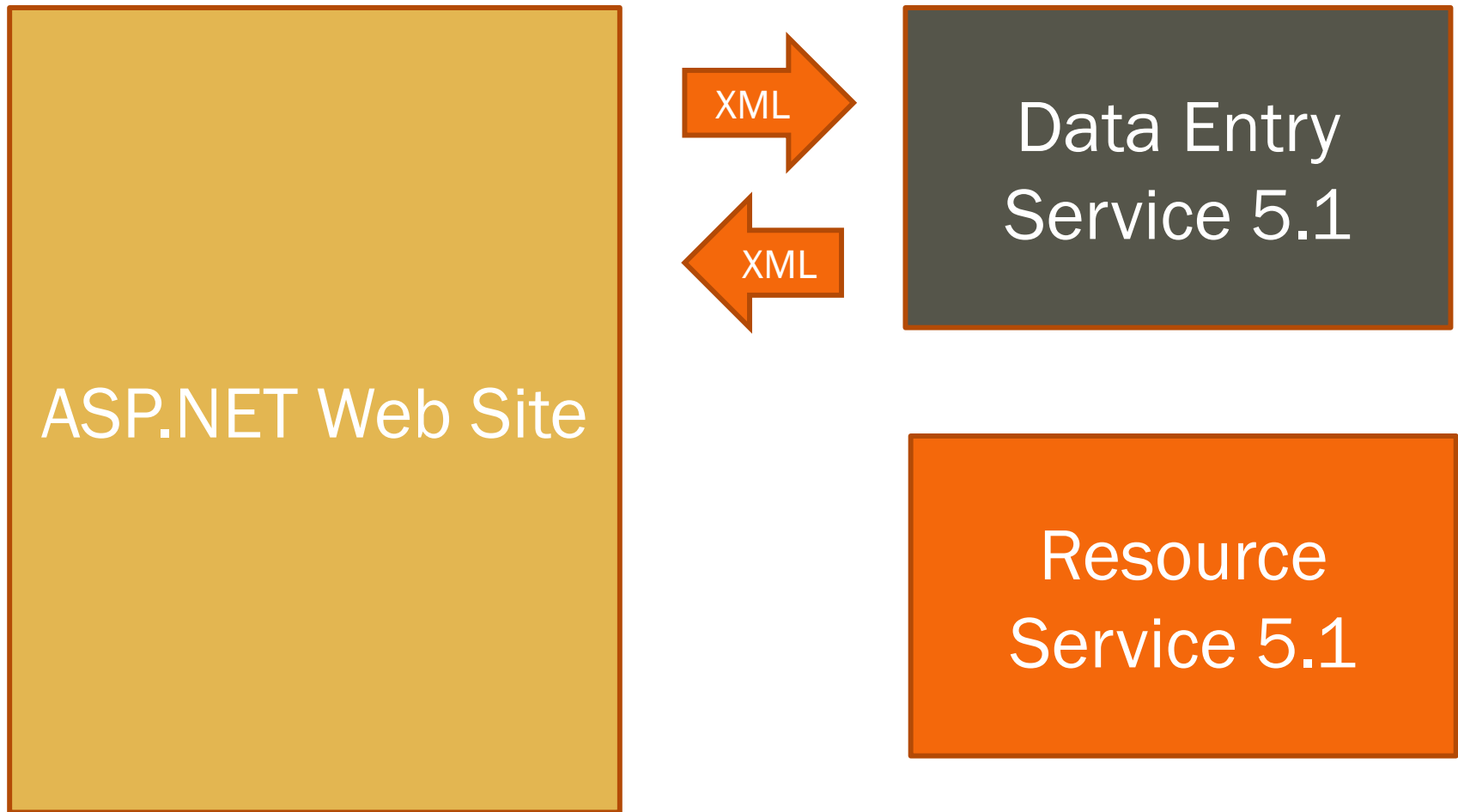
What is ASP.Net?

- ✎ Framework for building Web Sites
- ✎ Standard ASP Controls
- ✎ Code behind in C#
 - Update page
 - Handle events
- ✎ Output:
 - HTML with JavaScript
 - Supported by most (all?) Internet Browsers

ASP.Net based Data Entry

- ☞ Blaise ASP Web Site 'is' Data Entry Client:
 - Communication with Blaise Runtime Services
- ☞ Transforms general page to ASP
- ☞ Blaise ASP Controls:
 - Edit Field values
 - Server side events
- ☞ DEMO:
 - Pet Survey, [Car codes](#), No [JavaScript](#)
 - Non-Western Languages, Right To Left

ASP.Net Based Data Entry



ASP.NET Web Site

XML

Data Entry
Service 5.1

XML

Resource
Service 5.1

Internet Issues

☞ Many different browsers:

- Different capabilities
- Detect browser features (using Modernizr)

☞ Accessibility:

- Design web instrument for visually impaired people
- Out of the box by Blaise

Near future plans



Layout

- ✎ Blaise 5.0: Only single field layout
- ✎ Want special layout for multiple fields
- ✎ Similar to Blaise 4.8 Internet

Blaise 4 Other-Specify Group

What is your current classification in college?

- Freshman/first year
- Sophomore
- Junior
- Senior
- Other, please specify:

Master

Since high school, which of the following types of schools have you attended other than the one you are attending now? (Mark all that apply.)

- Vocational-technical school
- Community or junior college
- Other, please specify:

- None
- 4-year college other than this one

Blaise 4 Table Group

To what extent does your institution emphasize each of the following?

| | Very much | Quite a bit | Some | Very little |
|----|----------------------------------|-----------------------|-----------------------|-----------------------|
| 3a | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3b | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3c | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3d | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Layout (2)

- ☞ Need additional layout structure:
 - Should follow route path of Datamodel
 - Define Group of Fields
 - Specify Block Field to define layout
- ☞ Layout algorithm:
 - Defines pages according to layout structure
 - Group must be on single page
- ☞ Design templates for groups
- ☞ Want general solution:
 - Allow group inside group

Sample Other-Specify Group

```
GROUP OtherSpecifyGroup
  FIELDS
    Option: (First, Second, Third, Other)
    OtherQ: STRING[30]
  RULES
    Option.ASK
    IF Option = Other THEN
      OtherQ.ASK
    ENDIF
ENDGROUP
RULES
  OtherSpecifyGroup.ASK
```

Group Templates

- ☞ Specify User Interface elements for layout group:
 - Standard Controls
 - Placeholders
- ☞ Template Designer:
 - Modify templates in Resource Database
- ☞ Layout Specification:
 - Additional Layout Instructions
 - Assign templates to groups

Other-Category Template

```
<?xml version="1.0" encoding="utf-8" ?>
- <BuildingBlockTemplate>
  - <Columns>
    <Column Width="15" />
    <Column />
    <Column />
  </Columns>
  - <Items>
    <CategoryControl />
    <CategoryText ColumnIndex="1" />
    <FieldArea Name="OtherField" ColumnIndex="2" />
  </Items>
</BuildingBlockTemplate>
```

Designable Standard Pages

☞ Want user-defined:

- Error Page(s)
- Receipt Page

☞ Design Template:

- Use translatable texts
- Rich Text Controls

Field Properties

☞ Specify additional properties for Fields

- Define name and datatype
- Auxiliary or Data: Stored in Database?
- Accessible at runtime

☞ Benefits:

- Definition of paradata:
 - Easy to define and access
 - How to collect?

DATAPROPERTIES Remark: **OPEN**

AUXPROPERTIES IsVisited: **TBoolean**

Identifiable Checks

- ☞ Define named checks in section
- ☞ Use check names in Rules and Data Storage
- ☞ Benefits:
 - Improved overview of defined checks
 - Select records by query on checks
 - Can replace EditTypes

Sample Identifiable Checks

CHECKS

AgeForMarriage

```
"^Name is too young to be married" :  
(Married <> Yes) OR (Age > 15)
```

RULES

Age.**ASK**

Married.**ASK**

SIGNAL AgeForMarriage

IF AgeForMarriage = **SUPPRESSED THEN**

WhyMarriedYoung.**ASK**

ENDIF

Text Roles

☞ Field Texts:

- Define per Language
- Only Question, Description

☞ Need more texts:

- User-defined text roles
- Define texts for:
 - Each Role
 - Each Language

Sample Text Roles

```
LANGUAGES = ENG, NED
```

```
ROLES = Hint, Help
```

```
FIELDS
```

```
    Name
```

```
        ENG "What is your name? "
```

```
        NED "Wat is je naam?"
```

```
    Hint ENG "Surname"
```

```
        NED "Achternaam"
```

```
    Help ENG "Enter your surname"
```

```
        NED "Geef je achternaam"
```

```
    : STRING[30]
```

Questions?

