Shortening CRF Design and Database Set-up Process with a CDISC ODM Metadata-driven Approach

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Adding Value to Clinical Data

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IDDI : Expert Data Center

IDDI : Biostatistical services provider for phase I-IV clinical trials since 1991

- Expertise: oncology, ophthalmology & cardiovascular diseases
- 300+ Phase I-IV trials & involvement in 14 approvals
- Locations: Belgium & US
- Services:
  - Innovative trial design (sequential, adaptive...)
  - Randomization (IWRS) and Drug supply management
  - Efficient data management (paper and EDC)
  - Expert statistical analysis using SAS®, S-plus, EaST
  - Validation of biomarkers

(Old) Study Set-up Process

Multiple persons / teams…

… using multiple tools and documents

Study Team

Medical Affairs / Clinicians

EDC Developer

Database Programmer

Data Manager

Inefficiencies
Inconsistencies
Delays

Study Protocol

Annotated CRF

Data Validation Plan

EDC Library

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Advantages of ODM for EDC-CDM

1:1
EDC-CDM
application

Advantages

- Mapping between ODM and CRFs is trivial (1:1)
- ODM contains audit trail, signatures, internationalization
- ODM is extremely flexible to adapt to any kind of CRFs
- ODM contains XML-based value-level metadata that can be shared with SDTM
- ODM can integrate the SDTM controlled terminology

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ODM Metadata-driven approach

Basic idea

- Manage ALL relevant information in one document (XML ODM-based)
- Extract ALL necessary documents out of this single document (Annotated CRF, DVP, etc.)
- Use the ODM file directly to configure your EDC system

Requirements

- Make use of ODM metadata wherever possible
- (Compliant) ODM vendor extensions to cover additional information (e.g. to formalize queries / edit checks / DCFs)
- Style sheets / XML schemas (XSLT) to extract data in appropriate formats
- ODM compliant tools for further data processing

Advantages

- Vendor and application independent (CDISC ODM Certification)
- CRF structure and CRF metadata in one place; ideal basis for a CDISC based library
- Reduction of the number of involved applications (editors, design software…)
- Consistency of all involved documents by default
- Fast, efficient implementation of change requests and review cycles
- Reduction of validation / SOP effort thru automated procedures

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Configuration of ODM metadata

Study - ODM Study Composer/ODM SC Demo 090618 001 CL.xml - Eclipse SDK

File Edit Navigate Search Project Run Study Window Help

Validate on Save Transform

ODM Tree

- (Subject Protocol)
  - e.screening
    - f.ident
    - f.basedata
      - ig.demographics
      - ig.visitdate
      - ig.history1
        - i.height
        - i.weight
        - i.bmi
      - ig.history2
    - f.inex
    - f.laborbaseline
    - f.stenosis
    - f.basemedication
    - f.dismissal
  - e.follow-up
  - e.ae
  - e.DailyMeasurements
  - e.cycle1
  - e.cycle2

ODM SC Demo 090618 001 CL.xml

Data Definition

i.weight

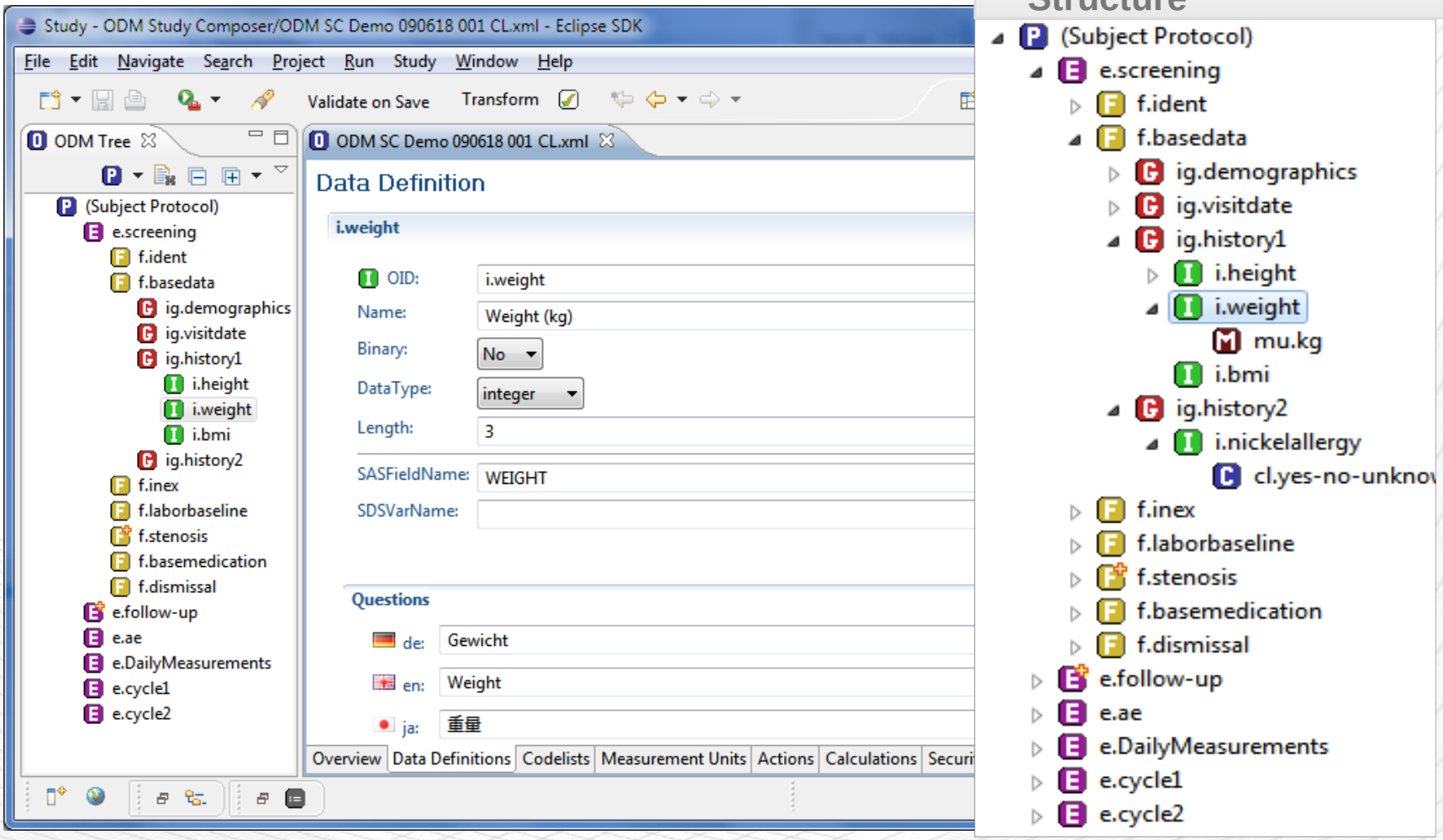
OID:	i.weight
Name:	Weight (kg)
Binary:	No
DataType:	integer
Length:	3
SASFieldName:	WEIGHT
SDSVarName:	

```
<ItemDef OID="i.weight" Name="Weight (kg)" DataType="integer" Lengt
  <Question>
    <TranslatedText xml:lang="de">Gewicht</TranslatedText>
    <TranslatedText xml:lang="en">Weight</TranslatedText>
    <TranslatedText xml:lang="ja">重量</TranslatedText>
    <TranslatedText xml:lang="ru">Вес</TranslatedText>
  </Question>
  <MeasurementUnitRef MeasurementUnitOID="mu.kg"/>
</ItemDef>
```

ODM based document generation (1)

Use the ODM structure to…

… describe your Study Structure



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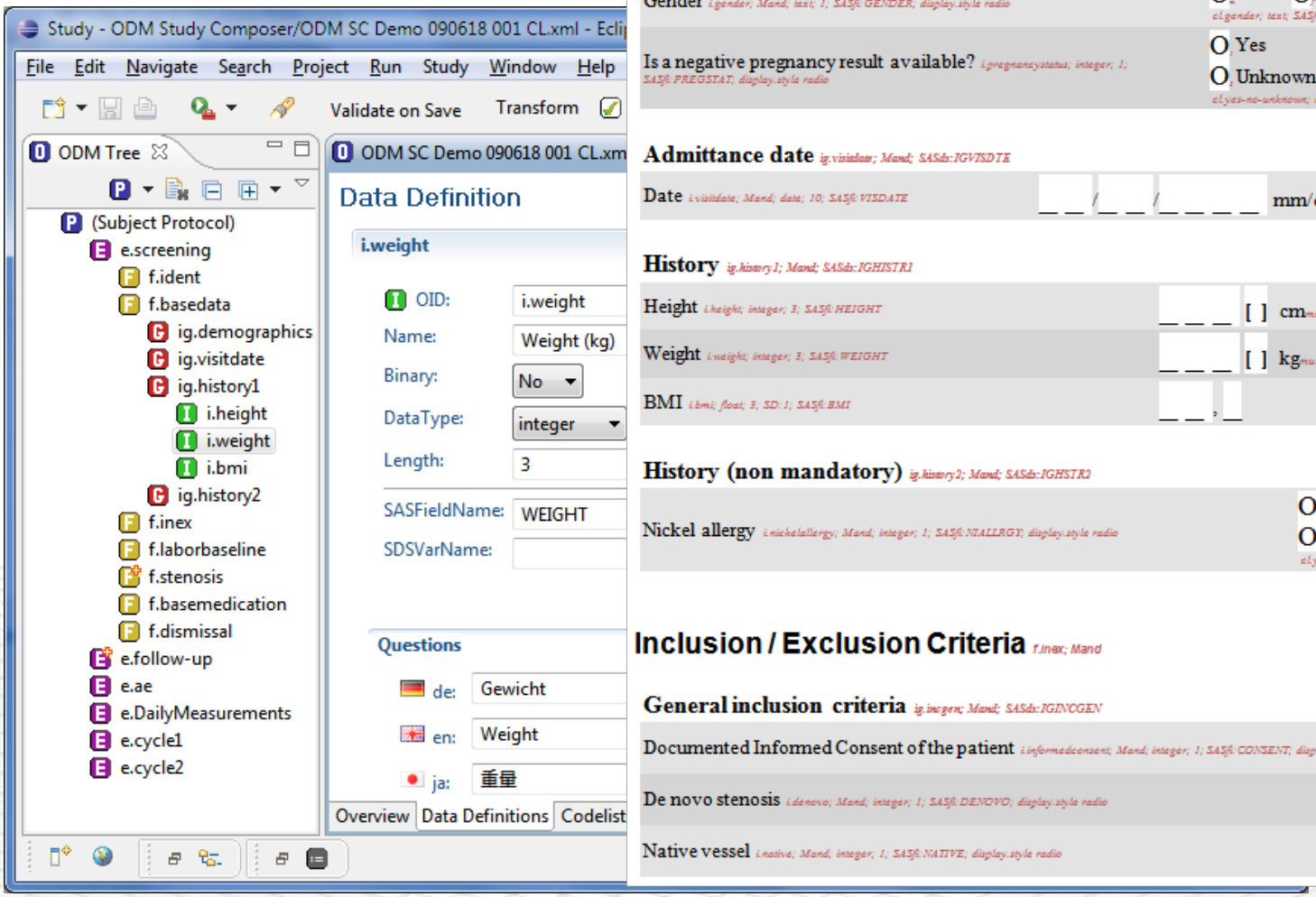
ODM based document generation (2)

… generate Annotated CRFs



Demographics *ig.demographics; Mand; SASds:IGDEMOG*

Gender *i.gender; Mand; text; 1; SASfi:GENDER; display.style radio* — O Male O Female *cl.gender; text; SASfo:CLSEX*

Is a negative pregnancy result available? *i.pregnancystatus; integer; 1; SASfi:PREGSTAT; display.style radio* — O Yes O No O Unknown *cl.yes-no-unknown; integer*

Admittance date *ig.visitdate; Mand; SASds:IGVISDTE*

Date *i.visitdate; Mand; date; 10; SASfi:VISDATE* — __ __ / __ __ / __ __ __ __ mm/dd/yyyy

History *ig.history1; Mand; SASds:IGHISTR1*

Height *i.height; integer; 3; SASfi:HEIGHT* — __ __ __ [ ] cm *mu.cm*

Weight *i.weight; integer; 3; SASfi:WEIGHT* — __ __ __ [ ] kg *mu.kg*

BMI *i.bmi; float; 3; SD:1; SASfi:BMI* — __ __ , __

History (non mandatory) *ig.history2; Mand; SASds:IGHSTR2*

Nickel allergy *i.nickelallergy; Mand; integer; 1; SASfi:NIALLRGY; display.style radio* — O Yes O No O Unknown *cl.yes-no-unknown; integer*

Inclusion / Exclusion Criteria *f.inex; Mand*

General inclusion criteria *ig.incgen; Mand; SASds:IGINCGEN*

Documented Informed Consent of the patient *i.informedconsent; Mand; integer; 1; SASfi:CONSENT; display.style radio* — O Yes O No *cl.yes-no; integer*

De novo stenosis *i.denovo; Mand; integer; 1; SASfi:DENOVO; display.style radio* — O Yes O No *cl.yes-no; integer*

Native vessel *i.native; Mand; integer; 1; SASfi:NATIVE; display.style radio* — O Yes O No *cl.yes-no; integer*

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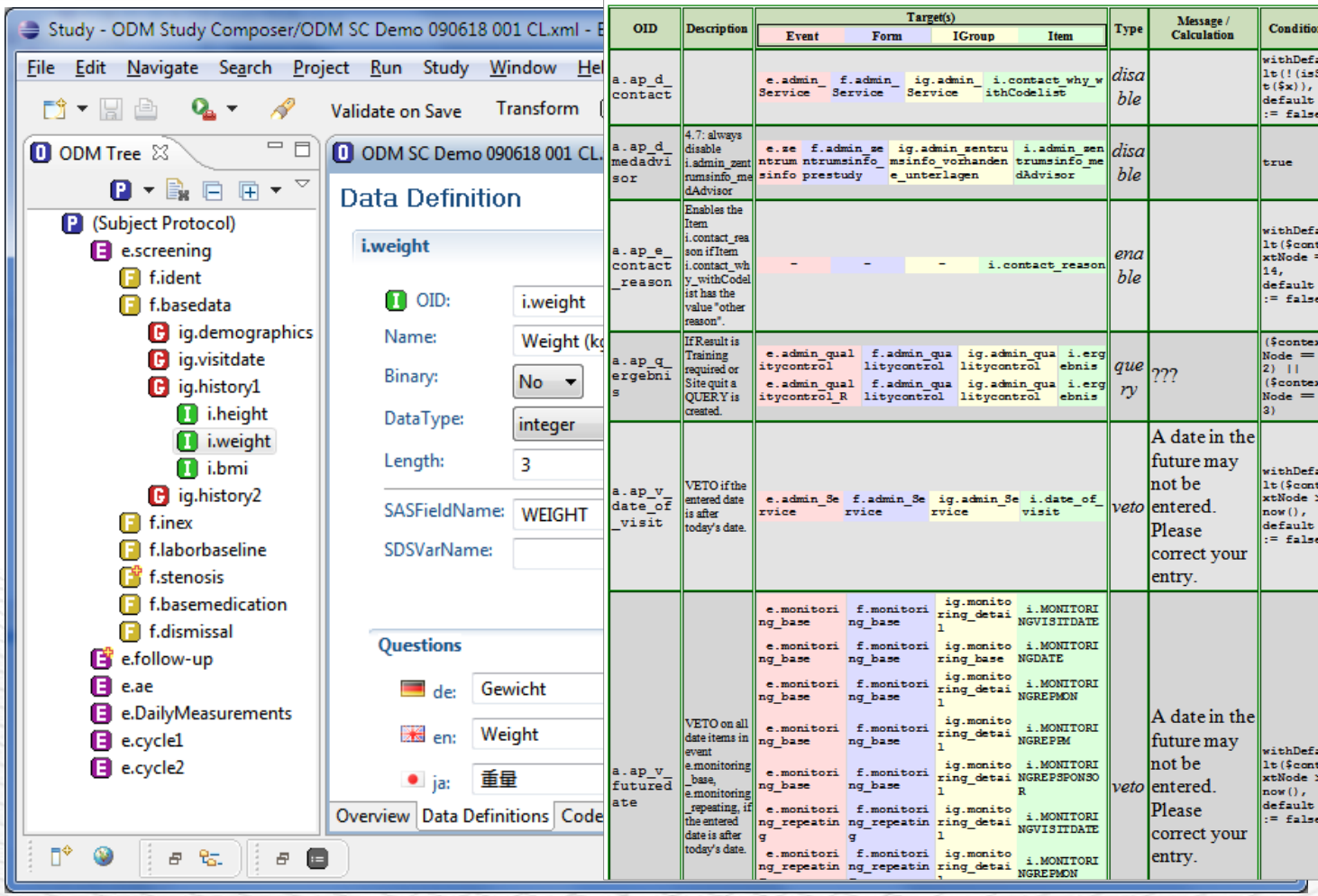
ODM based document generation (3)

… define a Data Validation Plan



Data Validation Plan

OID	Description	Target(s) Event	Form	IGroup	Item	Type	Message / Calculation	Condition	Variables Name Event Form IGroup Item
a.ap_d_contact		e.admin_Service	f.admin_Service	ig.admin_Service	i.contact_why_withCodelist	disable		withDefault(!(isSet($x)), default := false)	$x f.admin_Service ig.admin_Service i.contact_why_withCodelist
a.ap_d_medadvisor	4.7: always disable i.admin_zentrumsinfo_medAdvisor	e.ze ntrum sinfo	f.admin_zentrumsinfo_prestudy	ig.admin_zentrumsinfo_vorhandene_unterlagen	i.admin_zentrumsinfo_medAdvisor	disable		true	
a.ap_e_contact_reason	Enables the Item i.contact_reason if Item i.contact_why_withCodelist has the value "other reason".	-	-	-	i.contact_reason	enable		withDefault($contextNode == 14, default := false)	$contextNode i.contact_why_withCodelist
a.ap_q_ergebnis	If Result is Training required or Site quit a QUERY is created.	e.admin_qualitycontrol e.admin_qualitycontrol_R	f.admin_qualitycontrol	ig.admin_qualitycontrol	i.ergebnis	query	???	($contextNode == 2) \|\| ($contextNode == 3)	$contextNode - Target(s) -
a.ap_v_date_of_visit	VETO if the entered date is after today's date.	e.admin_Service	f.admin_Service	ig.admin_Service	i.date_of_visit	veto	A date in the future may not be entered. Please correct your entry.	withDefault($contextNode > now(), default := false)	$contextNode - Target(s) -
a.ap_v_futuredate	VETO on all date items in event e.monitoring_base, e.monitoring_repeating, if the entered date is after today's date.	e.monitoring_base e.monitoring_repeating	f.monitoring_base f.monitoring_repeating	ig.monitoring_detail ig.monitoring_base	i.MONITORINGVISITDATE i.MONITORINGDATE i.MONITORINGREPMON i.MONITORINGREPPM i.MONITORINGREPSPONSOR i.MONITORINGVISITDATE i.MONITORINGREPMON	veto	A date in the future may not be entered. Please correct your entry.	withDefault($contextNode > now(), default := false)	$contextNode - Target(s) -

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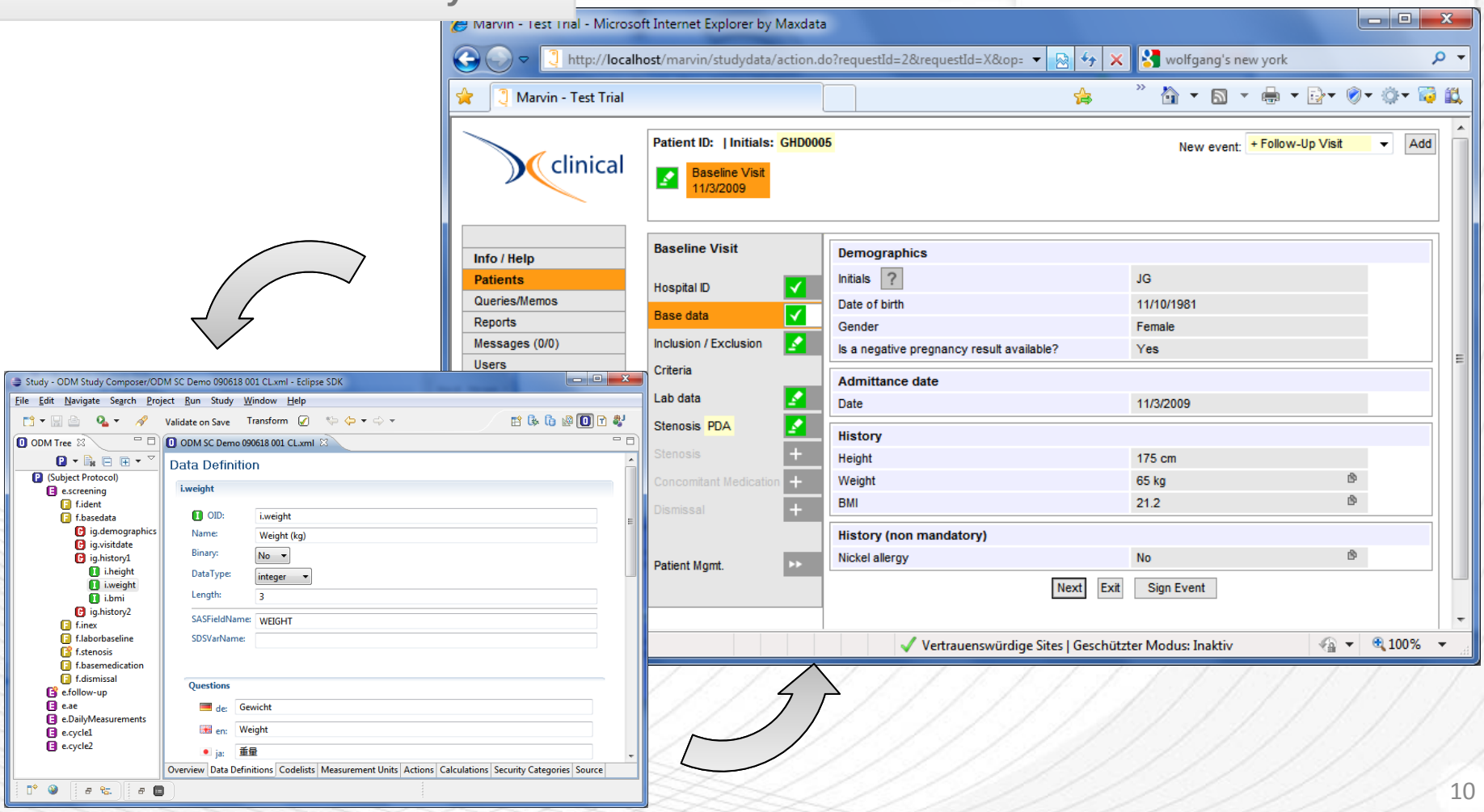
eCRF setup with ODM metadata

Fast and efficient Review Cycles



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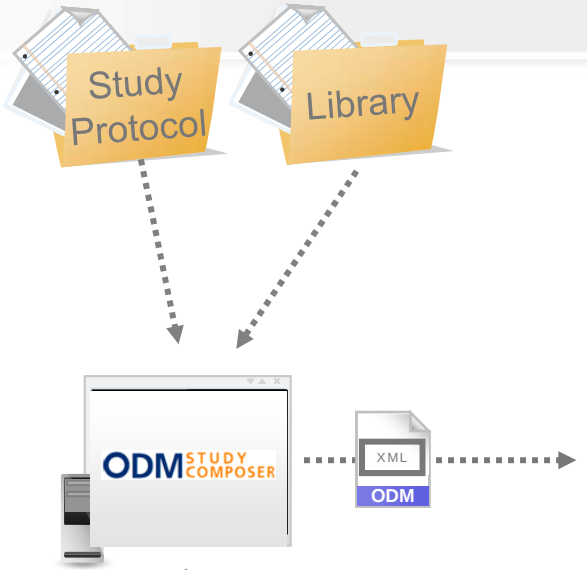
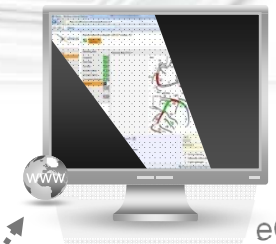
Fully Integrated, CDISC based Workflow



		ODM Data Import				ODM Data Export			
		Snapshot		Transactional		Snapshot		Transactional	
		Metadata	Data	Metadata	Data	Metadata	Data	Metadata	Data
Company: URL: Product: Version: Date of Certification: ODM Version:	ClinPhone (DataLabs) www.clinphone.com DataLabs Clinical V4.1.2.1 build 11300 12-Jun-07 V1.2 (V1.2.1)				✓	✓	✓	✓	✓
Company: URL: Product: Version: Date of Certification: ODM Version:	xClinical www.xclinical.com MARVIN V1.7.7 12-June-07 V1.2 (V1.2.1)	✓				✓	✓		
Company: URL: Product: Version: Date of Certification: ODM Version:	Medidata Solutions www.mdsol.com Medidata Designer V2.5 26-Sep-07 V1.2 (V1.2.1)					✓			
Company: URL: Product: Version: Date of Certification: ODM Version:	eRT www.ert.com EXPeRT EDC 5.0.0.1 11-Feb-08 V1.3	✓				✓	✓		
Company: URL: Product: Version: Date of Certification: ODM Version:	Medidata Solutions Worldwide www.mdsol.com Medidata Rave 5.6.2 (Batch Uploader 2.2.0.7, Data Exporter V1.1 and ODM Meta Importer V1.0) 16-Apr-08 V1.2 & V1.2.1	✓	✓	✓	✓				
Company: URL: Product: Version: Date of Certification: ODM Version:	XML4Pharma www.xml4pharma.com ODMDesigner 2008 R1 11-June-08 V1.2 & V1.2.1 and V1.3	✓		✓		✓			
Company: URL: Product: Version: Date of Certification: ODM Version:	PHT Corporation www.phtcorp.com StudyWorks 4.9.5 (ODM Conversion Style sheet, Version 1.0) 27-May-08 V1.2 & V1.2.1							✓	✓
Company: URL: Product: Version: Date of Certification: ODM Version:	Phase Forward, Incorporated www.phaseforward.com Central Designer Version 1.2 SP0 21-Oct-08 V1.3	✓							
Company: URL: Product: Version: Date of Certification: ODM Version:	Phase Forward, Incorporated www.phaseforward.com Inform Adapter Version 1.2 SP3 26-Nov-08 V1.3					✓	✓	✓	✓
Company: URL: Product: Version: Date of Certification: ODM Version:	flexcipio SA www.flexcipio.com eClinical Platform Version 1.1 17-Nov-08 V1.3	✓				✓	✓		
Company: URL: Product: Version: Date of Certification: ODM Version:	BioClinica, Inc www.bioclinica.com BioClinica Express and BioClinica Export Utility Version 4.1 07-Jun-09 V1.2					✓	✓	✓	✓



eCRF Screens

auto-generate

auto - generate

auto-generate

Query logic

CDISC ODM Database

IDDI experience with ODM

- > 1year of experience
- 9 DDE trials & 10 EDC trials
- Starting to see efficiency of ODM
- Still discovering new possibilities
- Technical specialization needed
- Easy to view structure, quick and flexible to implement new pages/queries
- Easy to implement amendment
- EDC = Longer study set up but complete
- Need to refrain creativity from sponsors

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Special Thanks

EDC made easy™

XClinical GmbH

Dr. Claus Lindenau

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Mail: **cl@xclinical.com**