



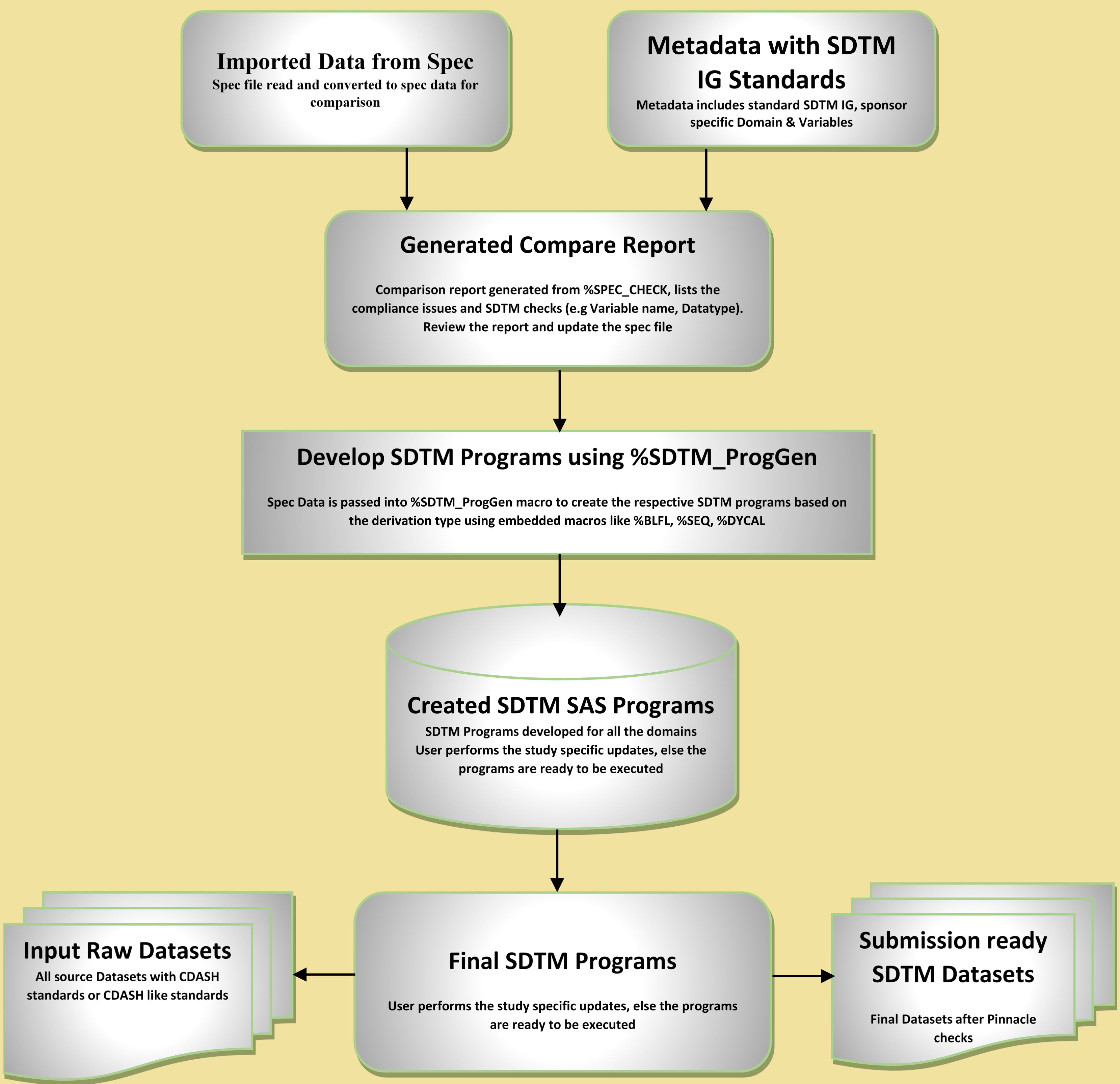
Abstract:

In pharmaceutical industry, submission of clinical trial data in CDISC standards is mandatory in US-FDA. Manual Standardization of clinical data is time consuming and repeated process. Automating the program creation process will reduce the time and human errors. This poster will focus on how SDTM program generation can be automated by SAS, using standard specification and standard metadata repository, - it could be CDISC standards or Sponsor defined standards. Also, it emphasis on the details of metadata repository and how that can be efficiently used for automation. The utility generated SAS programs will be in domain wise and can be used for further customization by the user.

Introduction:

CDISC SDTM is the set of specific standard requirements that should be followed in the preparation of submission datasets to regulatory authorities. As CDISC CDASH standards or standardized EDC are more widely adopted in the database design in clinical trials, SAS macros can be developed for the automated conversion to the SDTM data structure from mapping specification. This work introduces a method, that has been developed to facilitate the automation of standardized RAW – SDTM conversion. In addition to that, creating a standard metadata library for SDTM IG standards and custom domains based on therapeutic area and sponsor. This also includes basic compliance checks in mapping specification against the SDTM IG standards at variable attributes.

Process flow:



Sample Specification:

Source Variable	Target Variable	Variable Label	Datatype	Length	Controlled Terms or Format	Conversion Definition	Derivation	Derivation Order
STUDYID	STUDYID	Study Identifier	Char	\$200		XXXX	Assigned	
DOMAIN	DOMAIN	Domain Abbreviation	Char	\$200		AE	Assigned	
USUBJID	USUBJID	Unique Subject Identifier	Char	\$200		Concatenate STUDYID and SITEID and SUBJID separating by "-". Eg: "XXX-1001-1001"	%USUBJID	1
AESEQ	AESEQ	Sequence Number	Char	\$200		Sort by variable USUBJID, AESTDTC, AEENDTC, AETERM. Restart the numbering at each USUBJID with 1 (order sequentially).	%_SEQ	3
AEACN	AEACN	Action Taken with Study Treatment	Char	\$200	ACN	Direct Mapping from AEACN	Direct	
AESTDAT	AESTDTC	Start Date/Time of Adverse Event	Char	\$200	ISO 8601	Concatenate the variables AESTDAT and AESTTIM. Convert and to ISO 8601 format	%DTC	2
AESTTIM	AESTDTC	Start Date/Time of Adverse Event	Char	\$200	ISO 8601	Concatenate the variables AESTDAT and AESTTIM. Convert and to ISO 8601 format	%DTC	2
AEREL	AEREL	Causality	Char	\$200	AEREL	Direct Mapping from AEREL	Direct	
AESPID	AESPID	Sponsor Identifier	Char	\$200		Direct Mapping from AESPID	Direct	

Exception Compared Output:

Domain	Exception Level	Exception Message
AE	Variable Level	Variable label doesn't match for these variables:AESPID
AE	Datatype	Datatype doesn't match for variables:AESEQ

SDTM_ProgGen Macro Calling

```
*****;
/* Macro calling for SDTM Program Generation*/
*****;

%SDTM_progGen (iSpecDoc= , /* Full path and filename of Specification document*/
              (iDomains= , /* All or List of Domains with space delimited */
              (oProgLoc = /*Program output Location */
              );
```

Sample Code Generated for the above Spec:

```
STUDYID = "XXXX";
DOMAIN = "AE";

/*Direct Mapping Variables*/
AEACN = AEACN;
AEREL = AEREL;
AESPID = AESPID;

*****;
/* Derivation of Usubjid */
*****;
%Usubjid;

*****;
/*Create ISO 8601 Dates from Data and Time*/
*****;
%dtc_cal(in_ds=ae_der1, dat=aestdat, tim=aesttim op_ds=ae_der2);

*****;
/*Sequence number generation by the sort variables*/
*****;
%_seq(in_ds=ae_der2, sortvar=ae_sort, op_ds=ae);
```

Standard Metadata Repository:

All the SDTM IG standards and codelist will be placed in the metadata repository. So that we can have SDTM specification verified against all versions at the same time.

Centrally managed metadata repository can accelerate the implementation of standards and facilitate regulatory compliance, it also supports reusability of standard algorithms, automation of business processes and full data traceability.

Comparison Exception Report:

Report lists the Compliance issues in specification against the SDTM IG metadata in variable attributes, Codelist and datatypes etc. it helps to understand the spec issues at one go. The specification will be updated based on this report.

Advantages:

- ✓ Review the specification and identify the compliance issues in various level.
- ✓ Flexible for user to generate and update programs which reduces time and resource .
- ✓ Macros can be tweaked as per the need to deal with different projects
- ✓ Multiple macros can be integrated seamlessly.
- ✓ Spec and program consistency maintained throughout the process.
- ✓ Generated program files comply with industry and company standards and also accord with good programming practice.

Conclusion:

We have shown how to automate the process of creating clinical study data into an SDTM data. A result of this process is a mapping programs are fully generated automatically. In a further stage additional data checks could be implemented and given the user more information about required changes or also feedback about issues in the data. Also, the implementation of the define.xml documents could be easily implemented based on the complete specification. These utilities are under review at the time of submission of this paper.

References:

• SAS Institute Inc. 2009. SAS ® 9.2 Macro Language: Reference. Cary, NC: SAS Institute Inc.

• Clinical Data Acquisition Standards Harmonization (CDASH) User Guide, V 1.0 <https://www.cdisc.org/standards/foundational/cdash/cdash-model-10>

• Study Data Tabulation Model Implementation Guide: Human Clinical Trials Version 3.1.3 <http://www.cdisc.org/system/files/members/standard/sdtmigm3.1.3.zip>