Basic Understanding on SE Domain for Beginners

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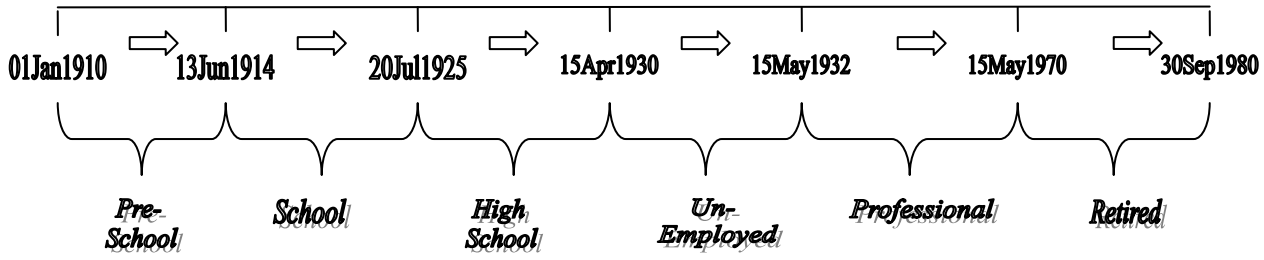
ABSTRACT

The Subject Element (SE) domain contains subject level data about the timings of each subject transitioned from one element (such as screening period, treatment period, follow-up period, etc.) to the other. These elements are presented in the Trial Element (TE) Domain by providing the rules for starting and stopping the element. To achieve this, other relevant domains are referenced. This paper is intended for the beginner in the clinical programming field to understand what this domain consists of, its significance, how do we create/ define this domain, its interdependence with other domains and finally how do we check that the domain so defined/ created is SDTM compliant.

SE DOMAIN: The preliminaries

It is very important for clinical programmer to clearly understand the life cycle of a subject in a given trial. The SE domain precisely achieves this objective. Let us take a canonical example in a non-clinical set-up to understand this at a conceptual level.

Suppose we are considering education and professional life as trial for a girl, say Sheila. Assume she was born on 1st Jan 1910; the next event is that she was enrolled to school on13th Jun1914; she completed schooling and joined high school on 20th Jul1925; completed her academics by graduating on 15th April1930. Then she began with the professional carrier on 15th May1932; and, after serving for around 30 years she got retired on 15th May1970. And finally, she gracefully died on 30th Sep1980. This entire sequence of event elements is depicted in the below picture.



There is also tabular way of representing the same facts as shown below:

Phase of Life	*Description of Phase*	*Phase Start Date*	*Phase End Date*
Pre- School	Time from birth to enrolment to school	1st Jan 1910	13th Jun 1914
School	Schooling Period	13th Jun 1914	20th Jul 1925
High School	High School Period	20th Jul 1925	15th Apr 1930
Un-Employed	Struggle Period	15th Apr 1930	15th May 1932
Professional	On Job Period	15th May 1932	15th May 1970
Retired	Rest Period	15th May 1970	15th May 1980

Recalling our SE domain terminology, this can be best described as follows:

ETCD	*Element*	*SESTDTC*	*SEENDTC*
Pre- School	Time from birth to enrolment to school	1910-01-01	1914-06-13
School	Schooling Period	1914-06-13	1925-07-20
High School	High School Period	1925-07-20	1930-04-15
Un-Employed	Struggle Period	1930-04-15	1932-05-15
Professional	On Job Period	1932-05-15	1970-05-15
Retired	Rest Period	1970-05-15	1980-05-15

Here ETCD stands for Subject Element Code, Element stands for Description of Subject Element, SESTDCTC for Start Date/ Time of Element and SEENDTC for End Date/ Time of Element.

SIGNIFICANCE OF SE DOMAIN

The discussion in the preceding example explains the importance of the SE domain to the clinical programmer. In fact, for the same reasons, submission of the SE dataset is strongly recommended as it provides required information to the regulatory (such as USFDA) reviewer to place observations in context within the study. The Trial Element (TE) and Trial Arm (TA) datasets should also be submitted as they define the design and terms referenced by SE dataset.

With the reference to the example we had, if Sheila got married on 26th Oct 1936, then we can superimpose/place this observation of marriage in her professional phase of life. Similarly, a regulatory/USFDA reviewer would be interested in knowing a particular serious adverse event (SAE) falls in which phase or element of the trial. SE domain is helpful to answer such questions. (Often, marriage is a SAE in the professional career!!!)

CREATION OF SE DOMAIN AND ITS INTERDEPENDENCY ON OTHER DOMAINS

The model for SE domain proposed by CDISC SDTM implementation guidelines is as follows.

Variable Name	Variable Label	Type	Controlled Terms or Format	Origin	Role	CDISC Notes	Core
STUDYID	Study Identifier	Char		CRF	Identifier	Unique identifier for a study within the submission.	Req
DOMAIN	Domain Abbreviation	Char	**SE	Derived	Identifier	Two-character abbreviation for the domain most relevant to the observation.	Req
USUBJID	Unique Subject Identifier	Char		Sponsor Defined	Identifier	Unique subject identifier within the submission.	Req
SESEQ	Sequence Number	Num		Derived	Identifier	Sequence number given to ensure uniqueness within dataset. Can be used to join related records.	Req
ETCD	Subject Element Code	Char	*	Sponsor Defined	Topic	1. Short name of ELEMENT, used for programming and sorting. 2. If an encountered Element differs from the planned Element to the point that it is considered a new Element, then use 'UNPLAN' as the value for ETCD to represent this Element.	Req
ELEMENT	Description of Subject Element	Char	*	Sponsor Defined / Protocol	Synonym Qualifier	The name of the Element. If an encountered Element differs from the planned ELEMENT to the point that it is considered a new ELEMENT, then ELEMENT should be Null	Perm
SESTDTC	Start Date/ Time of Element	Char	ISO 8601	CRF or Derived	Timing	Start date/time for an Element for each subject.	Exp
SEENDTC	End Date/ Time of Element	Char	ISO 8601	CRF or Derived	Timing	End date/time of an Element for each subject.	Exp
SEUPDES	Description of Unplanned Element	Char		Sponsor Defined	Synonym Qualifier	Description of what happened to the subject during this unplanned Element. Used only if ETCD has the value of 'UNPLAN'.	Perm

** indicates variable may be subject to sponsor-controlled terminology;*
*** indicates variable may be subject to external controlled terminology.*

- Firstly, we need to refer TE domain to understand the elements. An element is a building block for creating study cells. An element represents an interval of time that serves a purpose in a trial and is associated with certain activities affecting the subject.

- Element is further described by the rule for start and end of the event. Consider an example of the trial: a subject enrols into trial and signs inform consent form. He is randomized to receive a particular treatment and then comes for the follow-up. For this particular example the elements defined would be Screened, TRT and Follow-up. The Trial element (TE) dataset would be as follows:

  Table A:

ETCD	*Element*	*TESTRL*	*TEENRL*
Screened	Screening Period	Date of Informed Consent Signed	Date of First Dose Taken
TRT	Treatment Period	Date of First Dose Taken	Date of Follow-Up Visit
Follow-Up	Follow-Up Period	Date of Follow-Up Visit	End of Study or Discontinuation Date

  This information will be used to create SE domain.

- Identify the datasets using which TESTRL (Rule for start of element) and TEENRL (Rule for end of element) would be described at subject level. For example, for Screening element or Screened ETCD the Date of informed consent can be obtained by DS (i.e. Disposition) domain. For TRT element, Date of First Dose taken can be obtained from EX (i.e. Exposure) domain and for Follow-Up visit the date can be obtained from SV (i.e. Subject Visit) domain and Disposition or End of Study date can be obtained from DS (i.e. Disposition) domain. Overall to create SE we would need information from other relevant domains such as EX, DS and SV.

Study ID	Domain	Usubjid	Seseq	ETCD	Element	SESTDTC	SEENDTC
ABC	SE	ABC-01-01	1	Screening	Screening Period	DS.DSSTDTC	EX.EXSTDTC
ABC	SE	ABC-01-01	2	TRT	TRT Period	EX.EXSTDTC	SV.SVSTDTC
ABC	SE	ABC-01-01	3	Follow-Up	Follow-Up Period	SV.SVSTDTC	DS.DSSTDTC

Here Study ID stands for Study Identifier, Domain for Domain Abbreviations, Usubjid for Unique Subject Identifier, ETCD for Subject Element Code, Element for Description of Subject Element, SESTDCTC for Start Date/ Time of Element and SEENDTC for End Date/ Time of Element.

In this way, SE dataset is defined for one subject and can be generalized for others.

Note that, if the subject discontinues the trial after taking the drug but does not appear for the Follow-up visit then the Follow-up element would not appear for that subject. Hence, all elements present in TE domain may not be applicable for all subjects, especially for discontinued subjects. For example: Subject ABC-01-01 signed an informed consent on 01Apr1980 and received treatment on 07Apr1980, then after came for the follow-up on 10May1980 and discontinued the study on 18May1980. SE dataset for this subject would look like:

Study ID	Domain	Usubjid	Seseq	ETCD	Element	SESTDTC	SEENDTC
ABC	SE	ABC-01-01	1	Screening	Screening Period	1980-04-01	1980-04-07
ABC	SE	ABC-01-01	2	TRT	TRT Period	1980-04-07	1980-05-10
ABC	SE	ABC-01-01	3	Follow-Up	Follow-Up Period	1980-05-10	1980-05-18

SDTM COMPLIANCE

Below are the key points that need to be minimally checked to see if SE so created is SDTM compliant.

- SE dataset can not be null i.e. it should not contain zero observations.
- The variables with core attributes “Req” should not contain null observations.
- SESTDTC/SEENDTC should contain dates in the form ISO8601 (i.e. YYYY-MM-DDTHH: MM:SS). Only known part of the dates needs to be submitted.
- Domain value should be SE.
- There should be unique value for SESEQ.
- SESTDTC has to be less than or equal to SEENDTC.
- The values for the variable ETCD and ELEMENT should match with TE domain.
- There should not be any gap between the end date of the previous element and the immediate start date of the successive element.

CONCLUSION

It is observed that there are several ways of defining element of the trial. Through this paper we have tried to simplify the element definition and creation of SE. We hope that this paper would be helpful for all the beginners who are yet to program SE.

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REFERENCES

SDTM Version 3.1.1 Implementation Guide (http://www.cdisc.org).

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