

CDISC Technical Road Map 2008-2010

Purpose

The Road Map document provides an overview of the activities that CDISC will undertake, in the development and harmonization of current and future CDISC technical products, within the next two to three years. It discusses the drivers for those technical developments, the standards being developed, associated technical programmes and the dates by which the various activities will be completed.

CDISC Standards Today

The current set of CDISC production standards consist of:

- a) The Study Data Tabulation Model (SDTM) for the regulatory submission of Case Report Tabulations, including the Standard for the Exchange of Non-clinical Data (SEND).
- b) The Analysis Data Model (ADaM) for the regulatory submission of analysis datasets.
- c) The Operational Data Model (ODM) for the transfer of case report form data.
- d) The Laboratory Model (LAB) for the transfer of clinical laboratory data, including pharmacogenomics.
- e) The Biomedical Integrated Research Domain Group (BRIDG) model.
- f) The Case Report Tabulation – Data Definition Specification (define.xml).
- g) The Terminology standard containing terminology that supports all CDISC standards.
- h) The Glossary standard providing common meanings for terms used within clinical research.

Those standards being developed are:

- a) The Protocol Representation Group developing machine-readable medical research protocol standards including the Trial Design model shared with SDTM.
- b) The Clinical Data Acquisition Standards Harmonisation (CDASH) developing data acquisition standards.

The fact that a standard is a production standard does not preclude its further development. Indeed, the Terminology standard continues to be developed to meet the needs of all of the standards.

Vision

The CDISC Technical Road Map is designed to realise the vision of a set of harmonized standards that meet the CDISC Mission and Strategy. The set of standards has been, and will continue to be, developed to support the streamlining of processes within medical research from the production of clinical research protocols through to reporting and/or regulatory submission, warehouse population and/or archive and post-marketing studies/safety surveillance.

Drivers

CDISC has to accommodate the needs of its members while working with a large number of external organisations through formal relationships and alliances. This results in a number of drivers to CDISC's technical work:

- a) The CDISC Members with their input funnelled through the Industry Advisory Board (IAB)
- b) The CDISC Board of Directors with their strategic view documented within the CDISC strategy.
- c) The US FDA with their vision documented within their 5 Year IT plan
- d) The needs of the European national authorities as represented by direction derived from communications and cooperation with the EMEA.
- e) Organizations such as Health Level 7 (HL7), the World Health Organization (WHO), the US National Cancer Institute (NCI), the US National Library of Medicine (NLM), academic research institutions and the International Organization for Standardization (ISO) all of whom are working in various areas of the clinical research space.

Road Map Objectives

Overview and Principles

CDISC's efforts should and must support its stakeholders, encompassing those who have begun to implement standards and those about to commence standards implementation. In either case, stability of the standards is of major importance and CDISC will strive to ensure that the standards base is stable. Where at all possible, CDISC will maintain compatibility with all previous releases of the standards it develops.

CDISC will continue to work on the production standards, looking to improve them in light of operational experience. For example, the SDTM has been in production use for two years with the FDA and, as a result, they have a better understanding of what can be achieved through the use of standards. While continuously improving existing standards, CDISC has developed an understanding of the need to separate content standards from information transport standards. This allows for flexibility. As new transport (messaging) methods evolve, CDISC can protect the stability of content standards from underlying technological change embedded in transport standards. It also allows CDISC to develop the next generation of submission mechanisms while protecting industry from significant change.

As with all information exchange there is a need to share concepts. To do this successfully we need a common understanding of those concepts and means to exchange them. One key to this and of all of CDISC's work is terminology consistently applied across the standards. This will never be more apparent when medical research meets healthcare and the need to accommodate both worlds.

All of these factors lead to the main themes of the CDISC Road Map:

1. Harmonization of the existing content, including terminology and concepts, to ensure the interoperability of the standards and achieving full semantic interoperability.
2. The continued development of the CDISC standards through the addition of new content. Examples of such developments are CDASH and the CDISC HL7 Project.
3. The necessary Terminology to support 1 and 2 above.

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4. The separation of content standards from the means of transporting that content.
5. Provide an environment to allow for testing of the standards being developed.
6. Support members through the provision of tools that assist in implementing the standards and tools to verify the correct use of the standards.
7. Execute pilots with regulatory authorities to gain a better understanding of the needs of regulators and industry.
8. Forge technical solutions that provide for the integration of information between the larger healthcare community and clinical research.

These themes are elaborated in the following sections:

Harmonization of the Standards

CDISC's main target is the harmonization of the set of CDISC standards listed earlier in this document – both those in production and those being developed – to support the full life-cycle of medical research. This harmonization is a key part of the CDISC Road Map and central to that to the harmonization process is the BRIDG model. To ensure that a given standard will interoperate with another we need to ensure:

- a) that the concepts and content defined within the standard have agreed and clear definitions;
- b) that the relationships between those concepts are agreed;
- c) any terminology involved is agreed; and
- d) all of the concepts, relationships and terminology are modelled within and consistent with the BRIDG model.

When a production standard achieves all four of the criteria above, CDISC will consider the standard to be "harmonized with BRIDG". Two or more such "harmonized" standards are considered by CDISC to be interoperable (and, as such, free from conflict).

For a new standard the four steps defined above are now part of the normal development process (all new content shall be modelled in BRIDG). The next step would be to produce the standard, developed from the BRIDG model, which can be deployed by the user community. Such a standard would be harmonized with BRIDG by the nature of its development.

It is CDISC's intention to have harmonized the SDTM by the end of 2008 with ADaM scheduled for early 2009. The Protocol standard will be modelled in BRIDG prior to its initial release in 2008. The LAB standard is already BRIDG compliant.

Standards Development

CDISC will continue to develop new standards and extend the capability of the existing production standards. CDISC will:

1. Deliver CDASH Version 1.0 as a production standard in 2008.
2. Deliver Protocol Version 1.0 as a production standard and expand the protocol standard to include Statistical Analysis Plans in 2008.
3. Extend the LAB standard to include pharmacogenomics data in 2009.
4. Improve the SDTM to better support the FDA submission process in 2008.

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5. As part of the FDA's PDUFA IV 5 year IT plan, the FDA detailed its wish to see submission content delivered to the FDA using HL7 transport messages. The CDISC HL7 project is tasked with the development of the necessary messages with the SDTM content standard forming the core of the content as harmonized within the BRIDG model. Delivery of messages suitable for testing is scheduled for 2009.
6. Continue to develop the ADaM standard.
7. Upgrade the ODM to improve the support provided to those in industry who have already implemented the model. It is planned to release a small increment to the standard in 2008.
8. Update the CRT-DDS standard (define.xml) in 2008 to align with V1.3 of the ODM and to expand support to SDTM and ADaM metadata. This update will be available in late 2008.

Terminology

One key to the harmonization of the CDISC standards is the development of the terminology to support the existing standards and the work of harmonizing its standards with the BRIDG model. The development of harmonized terminology is a complex exercise involving multiple stakeholders such that the appropriate level of consensus is achieved. CDISC terminology development is focused around supporting the development and improvement of the existing standards, the harmonization of those standards and supporting the HL7 CDISC project.

During the coming year, CDISC will be examining its strategy for the development of terminology. It will look to improve the process by which terminology, the standards which use that terminology and the associated modelling within BRIDG can be accelerated. This strategy will be available in the second half of 2008.

Content & Transport

The separation of content from transport standards is another key CDISC aim. CDISC is keen to see the separation of content from the means by which that content is moved where the manifestation of the definition of that content is the BRIDG model.

As stated earlier, CDISC is working towards a harmonized set of standards where CDISC's core content is found within the SDTM/SEND, CDASH, ADaM, and Protocol standards. It is important that the remaining content is represented in BRIDG as soon as possible.

When this content is part of the BRIDG model, it will be possible for CDISC to take the content and represent it in a variety of transport mechanisms including HL7 messaging structures. This will isolate the medical research content from changes in transport technology. It will also allow for flexibility in the choice of transport formats for common content so as to protect users against changes in underlying messaging technologies.

CDISC Operational Road Map Environment (CORE)

With continuing development and rapid change, there is a need for standards to be tested within an environment that reflects their operational deployment. Such an environment will also allow the capabilities and benefits of those standards to be demonstrated. To achieve this, CDISC will consult with its members, especially vendors, to build such an environment.

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The initial release of the environment will be available by October 2008. The work will be based upon the End-to-End Workshop activities that CDISC has performed over the past few years.

Certification & Tools

CDISC has been running an ODM Certification Programme for the past year. It has evaluated and approved several vendors and further evaluations are taking place. CDISC is considering implementing a scheme for SDTM evaluations. Whereas the ODM Certifications focused on vendors' tools, the SDTM programme may take a different approach and investigate the desirability of a tool that can be used by industry themselves to assess the compliance of SDTM datasets.

CDISC also wishes to encourage its members to adopt standards by providing useful applications and tools via the CDISC website working with companies interested in supplying the tools on a non-commercial basis.

It is expected that tools will become available during the first half of 2008. A decision regarding SDTM certification will be taken during 2008 with a SDTM compliance toolset or certification programme being available in early 2009.

Pilots

As with all technological developments there is nothing that beats practical experience. The CORE project is designed to allow CDISC to gain such experience but there is also a need to undertake projects with external organizations and regulatory authorities in particular. Currently CDISC has three pilots with the FDA (either running or planned).

1. The Integrated Safety Data (ISD) pilot looks at the ability of SDTM and ADaM to support the integration of safety data across trials and compounds. This pilot will also include the TDM and will be completed in 2008 with final reports available early in 2009. JANUS note
2. The ODM Pilot examines the ability of the ODM standard to support the submission of Case Report Form data. The pilot should be completed sometime in 2009.
3. The SEND Pilot looks to enable the FDA to evaluate animal toxicity data submitted in SEND format in a regulatory setting by comparing SEND formatted data provided electronically as SAS transport file (XPT version 5) datasets with data provided in PDF. The pilot will run for three years from late 2008 until early 2011.

Link to Healthcare

CDISC's mission statement speaks of the need to integrate information between medical research and the healthcare communities. Over the last 4 years, CDISC has dedicated resources to the development of initiatives to examine this interaction. CDISC has worked closely with Integrating the Healthcare Enterprise (IHE) in pursuit of viable technical solutions to demonstrate that healthcare and medical research information can be linked. CDISC & IHE have collaborated on the Retrieve Form for Data Capture (RFD) profile and will be working on a second profile bringing the CDASH standard into the healthcare arena. CDISC will continue to work with IHE, HL7 and a large number of other organisations across the globe to further this cause and will develop a road map that will detail CDISC's aims in the next 3 to 5 years.

Integration with healthcare is also supported by the BRIDG model with the model's representation of medical research and the overlap into healthcare and based on its link to the HL7 Reference Information Model (RIM). The associated regulatory issues have been examined within the work performed by the

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electronic Source Data Interchange. This work will continue tasked with providing improved guidance related to US, European and other regulatory frameworks.

The Healthcare Link Road Map will be published by the third quarter 2008 and this document will contain a detailed plan for CDISC

Links to the CDISC Strategy

The following table maps the themes of the road map documented above to the CDISC strategy and where a significant contribution is made towards achieving the strategy.

	Harmonization / BRIDG	Standards Dev	Terminology	Content & Transport	CORE	Certification	Pilots	Link to healthcare
1. Approach to leveraging our global, non-profit, vendor neutral, independent status	X		X				X	X
2. Ensuring the existence, harmonization, acceptance and support of standards for medical research (including terminology)	X	X	X	X	X	X	X	
3. Preparing the integration with Electronic Health Records (EHR)/Health Information Technology (HIT)	X	X	X					X
4. Alliances to Standards Development Organizations (SDOs) and other key stakeholder organizations			X				X	X
5. Standards education and communication of best practices					X	X	X	
6. Safety data collection and reporting, including a focus on data aggregation enhanced by use of CDISC standards	X	X					X	X
7. Relationship to the Food and Drug Administration, European Medicines Agency (EMA), and Japan's Ministry of Health Labor and Welfare (MHLW) and other regulatory and health agencies	X	X	X			X	X	X

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References

1. FDA Five Year IT Plan, see <http://www.fda.gov/OHRMS/DOCKETS/98fr/07d-0481-gdl0001.pdf>
2. SEND Pilot, see <http://www.fda.gov/OHRMS/DOCKETS/98fr/E7-19468.pdf>
3. ODM Pilot, see <http://www.fda.gov/OHRMS/DOCKETS/98fr/E7-4451.pdf>