



Results of Survey to Gather the Use, Benefits and Tools of SNOMED CT

Report by the Chief Implementation and Innovation Officer

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1 Executive Summary

1.1 Introduction

An online survey of 32 questions was carried out between October 2010 and January 2011. The goal of the survey is to obtain general feedback on the use, benefits and tools of SNOMED CT. The 32 questions are divided into 3 sections. The first section has 4 questions about the respondent's organization characteristics. The second section, consisting of 7 questions, asks about the respondent's projects that use SNOMED CT. The last section, consisting of 18 questions, gathers SNOMED CT implementation details.

1.2 Results

There were 48 respondents, of which 40 indicated that they used SNOMED CT. The respondents were from 10 countries with government and vendor being the 2 largest groups. There were 62 projects enumerated by the respondents, deployed nationally, regionally or locally. The projects were typically installed in hospitals, physician groups and research facilities, with a budget of \$100,000 to \$1M, or less.

SNOMED CT was implemented in clinical documentation, research, and reporting systems. The most common users were clinicians, researchers and health information specialists. This finding is in line with the most commonly reported SNOMED CT use cases, which were clinical documentation, problem list and mapping to other classifications.

The survey revealed that the SNOMED CT hierarchies of clinical findings, procedures, disorders and body structures were highly utilized. There were also a high number of responses indicating the use of all of the SNOMED CT hierarchies. A number of respondents also reported the use of subsets, reference sets and extensions.

More than half of the respondents reported using terminology tools, with the common tool being a SNOMED CT browser. There were only a small number of respondents who reported the use of automated coding of free text or natural language processing.

The use of SNOMED CT brought benefits to the organization, usually with moderate to high user acceptance. However, respondents also reported finding SNOMED CT implementation to be from moderately difficult to difficult.

In conclusion, the 62 projects represented a wide range of use of SNOMED CT. The survey provided invaluable information on the functionalities of SNOMED CT that are actively used and the common use cases. Most organizations that used SNOMED CT experienced benefits with good user acceptance. However the implementation of SNOMED CT appeared to be difficult.

2 Introduction

2.1 Background

A work item in the 2010 work plan was to gather information on the use, benefits and tools of SNOMED CT. Work was started in the Implementation SIG with a proposed list of questions. Subsequently, the questions were posted to the I&I Committee, Member Forum and Affiliate Forum for feedback. The consensus of the comments received was that the original list of questions would require too much time to complete, and that many of the questions, being open ended, would require free text responses. Based on this feedback, Jim Case from the U.S. National Library of Medicine volunteered to revise the list of questions, with the intent of formulating a shorter survey and converting the open ended questions to ones with a list of responses. The final survey contains 32 questions and takes an average of 10 minutes to complete. The questions were presented to the I&I Committee and were approved.

2.2 Questions

The survey questions are designed to cover a broad range of topics. The results of the survey will determine future work direction. There are 38 questions, structured in 3 sections. The first section consists of 4 questions focusing on the survey respondent's organization's characteristics, such as the size and type of the organization, and also collects optional contact information. The second section consists of 7 questions focusing on the survey respondent's projects that use SNOMED CT. This section is able to collect information on up to 4 projects per respondent. Examples of the details captured are the project's name, budget and stages of implementation, and the type of facilities in which the project is implemented. The last section consists of 18 questions focusing on SNOMED CT implementation details. Questions in this section ask about the systems, tools and technology that use SNOMED CT, their features and functions, and the use cases. The complete set of questions is in Appendix 1.

2.3 Survey Approach

Three methods to conduct the survey were evaluated: (1) a word document with checkboxes for answering the questions; (2) a word document with embedded macros incorporating selection lists; and (3) a web survey. The desired criteria were: the survey should be easily accessible, the questions should be easy to answer, and the process to submit the responses should be simple. The first method of using a word document with checkboxes would require the respondent to download the posted survey and email back the completed and saved document, a multi-stage process that is inconvenient and has a low likelihood of completion. The second method of using a work document with embedded macros suffered from the same drawbacks as the first, and furthermore took a long time to load the macros, with up to 2 minutes of waiting before the survey could start. The third method, web survey, met all the criteria. The respondent would click on a web link. The online survey allows different ways of answering a question, such as checkboxes, drop down selection list, open

ended text entry and rules to channel to a specific next question based on the initial answer. The respondent could complete the survey at the same sitting, or come back to it later, as incomplete responses would automatically be stored on the online service. Therefore, the web survey method was felt to be the best because it would be easily accessible, simple to use, and collected responses are easily viewed and available for analysis.

The online survey link was posted in the I&I Collaborative Space on 29th October, 2010. Following a weekly schedule, the link was next posted in the Implementation SIG, Affiliate Forum and Member Forum. As of 18th January, 2011, there were 48 respondents to the survey.

3 Results of the Survey

The survey is divided into 3 sections:

- (1) Organization information – information on survey respondent's organization's characteristics.
- (2) Project overview – information on up to 4 of the respondent's projects that use SNOMED CT.
- (3) SNOMED CT implementation details – information about the respondent's implementation experience.

3.1 Section 1: Organization Information

This section contains 4 questions to gather basic information about the respondent's organization.

Question 1: Please enter your contact information

There were 48 respondents. The key information collected by this question is the country the respondent is from. Ten countries were represented and the distribution is shown in the table below:

Country	Response Count	Percentage (n=48)
Australia	6	12.5%
Canada	14	29.1%
Denmark	1	2.1%
Netherlands	2	4.2%
Singapore	1	2.1%
Spain	1	2.1%
Sri Lanka	1	2.1%
Sweden	2	4.2%
United Kingdom	7	14.5%
United States	13	27.1%

Question 2: Which one of the following best describes your organization?

There were 48 responses, shown in the table below:

Type of Organization	Response Count	Percentage (n=48)
Vendor	11	22.9%
Health Care Enterprise	5	10.4%
Medical Clinic	2	4.2%
Government Institution	17	35.4%
Consulting	4	8.3%
University	7	14.6%
Other	2	4.2%

Question 3: What is the size of your organization? (Number of employees)

There were 47 responses; 1 respondent skipped the question. The responses are shown in the table below.

Size of Organization	Response Count	Percentage (n=47)
49 or Fewer Employees	17	36.2%
100 – 499 Employees	10	21.3%
500 – 999 Employees	5	10.6%
1,000 – 4,999 Employees	8	17.0%
5,000 – 9,999 Employees	4	6.4%
10,000 and Over Employees	3	8.5%

Question 4: Do you use SNOMED CT?

There were 48 responses, shown in the table below:

Uses SNOMED CT	Response Count	Percentage (n=48)
Yes	40	83.3%
No	8	16.7%

A respondent who answered “No” to this question would not be required to complete the remainder of the survey.

3.2 Section 2: Project Overview

This section contains 7 questions to gather information on respondents’ projects that use SNOMED CT. The first question allows the respondents to list up to 4 of their highest priority projects and questions 2 to 7 collect information on each of these projects. Each question allows the respondent to select all the items that apply to the project being surveyed.

The results are summarized here by categories reported. The individual project details are in Appendix 2.

Question 1: Name the project(s) or program(s) using SNOMED CT (or name of software application) in order of importance.

The 40 respondents who answered “Yes” to the question “Do you use SNOMED CT?” were given the option to state up to 4 projects in order of importance. Of the 40, 31 described at least 1 project, 18 described 2 projects, 8 described 3 projects, 2 described 4 projects, and 2 stated that they have more than 4 projects. The results are shown in the table below.

Number of Projects Described	Response Count	Percentage (n=31)
1	31	100%
2	18	58.1%
3	8	25.8%
4	2	6.5%
More than 4	2	6.5%

Question 2: What type of project(s) does this represent?

For each of the projects stated in question 1 of this section, the respondents were given 4 options to indicate the type of their projects. They could choose all applicable options, or none. The 31 respondents who stated that they had at least 1 project that uses SNOMED CT selected 53 project types in total, across all the projects. The types of projects are summarized in the table below.

Type of Project	Response Count	Percentage (n=53)
Proof of Concept	14	26.4%
Pilot	15	28.3%
Production	22	41.5%
Enhancement	2	3.8%

Question 3: What is the extent of implementation?

For each of the projects stated in question 1 of this section, the respondents were given 3 options to indicate the extent of the project’s implementation. They could choose all applicable options, or none. There were 30 respondents who selected 41 responses across all the projects. The results are summarized in the table below.

Extent of Implementation	Response Count	Percentage (n=41)
National	16	39.0%
Regional	10	24.4%
Local	15	36.6%

Question 4: What is the implementation phase of the project(s)?

For each of the projects stated in question 1 of this section, the respondents were given 5 options to indicate the implementation phase of the project(s). They could choose all applicable options, or none. There were 31 respondents who selected 63 responses across all the projects. The results are summarized in the table below.

Implementation Phase	Response Count	Percentage (n=63)
Planning	6	9.5%
Analysis	9	14.3%
Design	14	22.2%
Construction	15	23.8%
Maintenance	19	30.2%

Question 5: What type of facilities is the project(s) implemented in, or planned for? (Check all that apply)

For each of the projects stated in question 1 of this section, the respondents were given 6 options to indicate the type of facilities the project is implemented in or planned for. They could choose all applicable options, or none. There were 29 respondents who selected 61 responses across all the projects. The results are summarized in the table below.

Type of Facility	Response Count	Percentage (n=61)
Hospital	22	36.1%
Physician Group/GP	12	19.7%
Independent Laboratory	6	9.8%
Public Health Organization	6	9.8%
Patient-Driven Organization	3	4.9%
Research	12	19.7%

Question 6: What is the time frame of implementation (to production)?

For each of the projects stated in question 1 of this section, the respondents were given 5 options to indicate the time frame of implementation. They could choose all applicable options, or none. There were 30 respondents who selected 41 responses across all the projects. The results are summarized in the table below.

Time Frame of Implementation	Response Count	Percentage (n=41)
In Production Now	21	51.2%
Less than 1 Year	13	31.7%
1 to 2 Years	4	9.8%
3 to 5 Years	2	4.9%
Greater than 5 Years	1	2.4%

Question 7: What is the budget for implementation, excluding operating cost? (in US dollars)

For each of the projects stated in question 1 of this section, the respondents were given 6 options to indicate the budget for implementation, excluding operating costs. They could choose all applicable options, or none. There were 31 respondents who selected 39 responses across all the projects. The results are summarized in the table below.

Budget for Implementation	Response Count	Percentage (n=39)
Less than \$100,000	15	38.5%
\$100,000 to \$1M	10	25.6%
\$1M to \$3M	1	2.6%
Greater than \$3M	2	5.1%
Decline to State	2	5.1%
Don't Know	9	23.1%

3.3 Section 3: SNOMED CT Implementation

This section contains 18 questions to gather information on the respondent's implementation experience.

Question 1: List the types of systems where SNOMED CT is implemented (Check all that apply)

Respondents were given 14 options to indicate the systems where SNOMED CT was implemented. They could choose all applicable options, or none. There were 32 respondents. The top three types of systems that implemented SNOMED CT were Clinical Documentation, Research, and Terminology Server/Services. The results are summarized in the table below.

Type of System	Response Count	Percentage (n=32)
Laboratory Information Management System (LIMS)	6	18.8%
Pharmacy	5	15.6%
Radiology	3	9.4%
Clinical Documentation (CPOE, EHR, Nursing, Dietary)	18	56.3%
Research	16	50.0%
Reporting (Registries, Infectious Disease, Biosurveillance)	13	40.6%
Reimbursement	5	5.6%
Decision Support	9	28.1%
Quality Assurance	9	28.1%
Data Warehouse/Analytics	9	28.1%
Personal Health Record	7	21.9%
Genomics	2	6.3%
Interoperability/Interface Engine	9	28.1%
Terminology Server/Services	14	43.8%
Others	6	18.8%

Question 2: What are your use cases for SNOMED CT? (Check all that apply)

Respondents were given 11 options to indicate their use cases for SNOMED CT. They could choose all applicable options, or none. There were 30 respondents. The top 3 use cases were Clinical Documentation, Problem List and Mapping to Other Classifications (ICD9, ICD10). The results are summarized in the table below.

Use Case	Response Count	Percentage (n=30)
Patient Summary/Discharge	13	43.3%
Problem List	16	53.3%
Medication List	9	30.0%
Allergy List	9	30.0%
Clinical Documentation	19	63.3%
Order Communication and Results Reporting	7	23.3%
Public Health including Notifiable Diseases	8	26.7%
Medication/Allergy Management	9	30.0%
Continuity of Care/Discharge Plans	9	30.0%
Mapping to Other Classifications (ICD9, ICD10)	14	46.7%
Meaningful Use	6	20%
Not Applicable	4	13.3%
Others	4	13.3%

Question 3: List the type of system users (Check all that apply)

Respondents were given 8 options to indicate their types of system users. They could choose all applicable options, or none. There were 32 respondents. The top 3 types of system users were Clinicians, Researchers and Medical Records/Health Information Management Specialists. The results are summarized in the table below.

Type of System User	Response Count	Percentage (n=32)
Clinicians	26	81.3%
Researchers	19	59.4%
Health Policy Makers	5	15.6%
Administrators/Management	9	28.1%
Information Technologists	12	37.5%
Medical Records/ Health Information Management Specialists	17	53.1%
Patients	6	18.8%
Educators	6	18.8%
Others	2	6.3%

Question 4: Which SNOMED CT hierarchies are you using? (Check all that apply)

Respondents were asked to select the SNOMED CT hierarchies they are using. They were allowed to select multiple items. There were 32 respondents. The top 3 SNOMED CT hierarchies used were Clinical Findings, Procedures and Disorders. The results are summarized in the table below.

SNOMED CT Hierarchy	Response Count	Percentage (n=32)
All	12	37.5%
Clinical Findings	18	56.3%
Disorders	14	43.8%
Procedures	17	53.1%
Body Structures	10	31.3%
Organisms	4	12.5%
Physical Forces	2	6.3%
Substances	5	15.6%
Specimens	9	28.1%
Social Contexts	3	9.4%
Attributes	4	12.5%
Context Dependent Categories	2	6.3%
Physical Objects	2	6.3%
Events	7	21.9%
Observable Entities	8	25.0%
Environments and Geographical Location	1	3.1%
Qualifier Value	6	18.8%
Staging and Scales	4	12.5%
Special Concepts	1	3.1%
Pharmaceutical/Biologic Product	6	18.8%
Record Artifact	1	3.1%
Don't Know	0	0%

Question 5: Are there any terminology specific tools used in the implementation of SNOMED CT?

There were 32 responses, shown in the table below.

Use of Terminology Specific Tools	Response Count	Percentage (n=32)
Yes	20	62.5%
No	12	37.5%

The respondents who answered “Yes” to this question were asked to specify the tools via free-text entries. The responses are listed below:

1. SnomedBrowser.com
2. Smarttermer and SmartCoder

3. In house tools. Evaluating commercial tools
4. Link to ICD-10
5. Electronic CAP cancer checklists (eCC)
6. Our own local browser/editor
7. Snapper
8. In-house developed terminology server
9. Have developed SNOMED search engine
10. Cliniclue
11. Customized browsing tool supported by Apelon. We use the UMLS version of SNOMED
12. Concept groupers, hierarchy navigators
13. Apelon tools
14. Internal tools
15. Browsers and systems built by our department
16. Cross-maps, namespaces, terminology browsers, sub/ref sets
17. We will start use the workbench in 2011. We are just now evaluating the need for other tools
18. Snapper, Medical Objects (MO) browser, Cliniclue, MO Gello engine, the MO GLIF editor, MO archetype editor
19. Only our own tools
20. Terminology server, text to SCT converter

Question 6: Are subsets/reference sets of SNOMED CT being used?

There were 33 responses, shown in the table below.

Use of Subsets/Reference Sets	Response Count	Percentage (n=33)
Yes	19	57.6%
No	14	42.4%

Respondents who answered “Yes” to this question were asked to provide the estimated number of subsets/reference sets in use, which ranged from 1 to 168. The 3 highest numbers were 168, 100+ and 80 subsets/reference sets.

Question 7: Is any natural language processing or similar technology being used with SNOMED CT?

There were 33 responses, shown in the table below.

Use of Natural Language Processing Technology	Response Count	Percentage (n=33)
Yes	7	21.2%
No	26	78.7%

Question 8: Are SNOMED CT extensions, national or local, being used?

There were 33 responses, shown in the table below.

Use of SNOMED CT Extensions	Response Count	Percentage (n=33)
Yes	17	51.5%
No	16	48.5%

Question 9: Are mappings from SNOMED CT to other terminologies or classifications being used?

There were 33 responses, shown in the table below.

Mapping SNOMED CT to Other Terminologies or Classifications	Response Count	Percentage (n=33)
Yes	24	72.7%
No	9	27.3%

Question 10: Do you use a terminology browser for SNOMED CT?

There were 33 responses, shown in the table below.

Use a terminology Browser for SNOMED CT	Response Count	Percentage (n=33)
Yes	31	93.9%
No	2	6.1%

Question 11: Please indicate your usage of terminology browsers

The respondents who answered “Yes” to using a SNOMED CT browser were asked to indicate their usage of Cliniclue, NCI Terminology Browser, SNOB, SnoFlake, and Virginia Tech Browser. A category of “Other” was also included. The responses are shown in the table below.

Browser	Use Extensively	Use Occasionally	Never Use	Response Count
Cliniclue	64.3% (18)	25.0% (7)	10.7% (3)	28
NCI Terminology Browser	4.5% (1)	27.3% (6)	68.2% (15)	22
SNOB	15.0% (3)	25.0% (5)	60% (12)	20
SnoFlake	0% (0)	21.1% (4)	78.9% (15)	19
Virginia Tech Browser	5.0% (1)	20.0% (4)	75.0% (15)	20
Other	56.3% (9)	12.5% (2)	31.3% (5)	16

The 16 respondents who selected “Other” were asked to specify the browser via free-text entries. A summary of the responses is shown in the table below.

Browser	Response Count
SnomedBrowser.Com	1
3M SCTb	1
SnoCode	1
Snapper/Minnow	2
Mycroft	2
NHS Browser	1
U Sydney Web Browser	1
Internally Developed	7

Question 12: Do you have an automated coding of free text to SNOMED CT?

There were 33 responses, shown in the table below.

Automated Coding of Free Text	Response Count	Percentage (n=33)
Yes	9	27.3%
No	24	72.7%

Question 13: Does your organization benefit from the use of SNOMED CT?

There were 32 responses, shown in the table below.

Benefit Category	Response Count	Percentage (n=32)
No Benefit	2	6.2%
Little Benefit	0	0%
Some Benefit	8	25%
Moderate Benefit	6	18.8%
Large Benefit	6	18.8%
Very Large Benefit	4	12.5%
Not Yet Implemented	5	15.6%
Don't Know	1	3.1%

Question 14: Rate the user acceptance of the implementation of SNOMED CT

There were 32 responses, shown in the table below.

User Acceptance	Response Count	Percentage (n=32)
No Acceptance	2	6.2%
Little Acceptance	2	6.2%
Some Acceptance	4	12.5%
Moderate Acceptance	8	25.0%
Large Acceptance	7	21.9%
Very Large Acceptance	0	0%
Not Yet Implemented	3	9.4%
Don't Know	6	18.8%

Question 15: Rate the level of difficulty you experience in implementing SNOMED CT

There were 33 responses, shown in the table below.

Level of Difficulty	Response Count	Percentage (n=33)
Very Easy	2	6.1%
Easy	0	0%
Moderately Easy	4	12.1%
Moderately Difficult	14	42.4%
Difficult	8	24.2%
Very Difficult	2	6.1%
Not Yet Implemented	2	6.1%
Don't Know	1	3.0%

Question 16: How would you rate the availability and quality of information relating to implementing SNOMED CT?

There were 32 responses, shown in the table below.

Availability and Quality of Information	Response Count	Percentage (n=32)
Non Available	0	0%
Very Poor	1	3.1%
Poor	3	9.4%
Moderately Poor	9	28.1%
Moderately Good	11	34.4%
Good	6	18.7%
Excellent	2	6.3%

Question 17: Are you aware of the resources available from the International Health Terminology Standards Development Organisation (IHTSDO)?

There were 31 responses, shown in the table below.

Aware of Resources Available	Response Count	Percentage (n=31)
Yes	27	87.1%
No	4	12.9%

Question 18: Would you be willing to accept a follow up regarding the topics of this survey? (Your agreement does not affect the confidentiality of your responses)

There were 33 responses, shown in the table below.

Willing to Accept a Follow Up	Response Count	Percentage (n=33)
Yes	30	90.9%
No	3	9.1%

Question 19: If you are willing to participate in a follow up survey, what would you prefer? (Check all that apply)

There were 39 respondents providing a total of 54 responses, as multiple options could be selected. The results are shown in the table below.

Preference for Follow Up	Response Count	Percentage (n=54)
Phone Survey	11	20.4%
Online Survey (Web Based)	22	40.7%
Email and Structured Forms	19	35.2%
Not Interested	2	3.7%

Question 20: Would you like to know more about SNOMED CT and its use?

There were 38 responses, shown in the table below.

Would Like to Know More	Response Count	Percentage (n=39)
Yes	19	50.0%
No	19	50.0%

Question 21: Other comments/feedback?

Respondents were invited to provide their comments, which are collected in Appendix 3.

4 Appendices

Appendix 1

Complete Set of Survey Questions

IHTSDO Short Survey on Implementation of SNOMED CT

1. IHTSDO Short Survey on Implementation and Use of SNOMED CT

IHTSDO is conducting a survey to seek information on activities relating to SNOMED CT implementation. The information from this survey will help IHTSDO to plan their future activities and identify areas of focus. Your responses will be confidential.

Section 1: Organization Information

* 1. Please enter your contact information.

*Name:	<input type="text"/>
*Organization/Company:	<input type="text"/>
Address 1:	<input type="text"/>
Address 2:	<input type="text"/>
City/Town:	<input type="text"/>
State/Province:	<input type="text"/>
ZIP/Postal Code:	<input type="text"/>
*Country:	<input type="text"/>
*Email Address:	<input type="text"/>
*Phone Number:	<input type="text"/>

2. Which one of the following best describes your organization?

- Vendor
- Health Care Enterprise
- Medical Clinic
- Government Institution

Other (please specify)

3. What is the size of your organization? (Number of employees)

- 49 or Fewer
- 100-499
- 500-999
- 1,000-4,999
- 5,000-9,999
- 10,000 and Over

IHTSDO Short Survey on Implementation of SNOMED CT

* 4. Do you use SNOMED CT?

Yes

No

IHTSDO Short Survey on Implementation of SNOMED CT

2. Project Overview

1. Name of project(s) or program(s) using SNOMED CT (or name of software application) in order of importance.

Project 1	<input type="text"/>
Project 2	<input type="text"/>
Project 3	<input type="text"/>
Project 4	<input type="text"/>
More (List Projects)	<input type="text"/>

2. What type of project(s) does this represent?

	Project 1	Project 2	Project 3	Project 4
Proof of Concept	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pilot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhancement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. What is the extent of implementation?

	Project 1	Project 2	Project 3	Project 4
National	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. What is the implementation phase of the project(s)?

	Project 1	Project 2	Project 3	Project 4
Planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analysis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Construction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintenance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments

IHTSDO Short Survey on Implementation of SNOMED CT

5. What type of facilities is the project(s) implemented in, or planned for? (Check all that apply)

	Project 1	Project 2	Project 3	Project 4
Hospital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physician Group/GP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Independent Laboratory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public Health Organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patient-Driven Organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)	<input type="text"/>			

6. What is the time frame of implementation (to production)?

	Project 1	Project 2	Project 3	Project 4
In Production Now	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Less than 1 year	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1 to 2 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 to 5 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Greater than 5 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. What is the budget for implementation, excluding operating cost? (In US dollars)

	Project 1	Project 2	Project 3	Project 4
Less than \$100,000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
\$100,000 to \$1M	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
\$1M to \$3M	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Greater than \$3M	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decline to State	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Don't Know	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. SNOMED CT Implementation Details

1. List the types of systems where SNOMED CT is implemented. (Check all that apply)

- Laboratory Information Management System (LIMS)
- Pharmacy
- Radiology
- Clinical Documentation (CPOE, EHR, Nursing, Dietary)
- Research
- Reporting (Registries, Infectious Disease, Biosurveillance)
- Reimbursement
- Decision Support
- Quality Assurance
- Data Warehouse/Analytics
- Personal Health Record
- Genomics
- Interoperability/Interface Engine
- Terminology Server/Services

Other (please specify)

IHTSDO Short Survey on Implementation of SNOMED CT

2. What are your use cases for SNOMED CT? (Check all that apply)

- Patient Summary/Discharge
- Problem List
- Medication List
- Allergy List
- Clinical Documentation
- Order Communication and Results Reporting
- Public Health including Notifiable Diseases
- Medication/Allergy Management
- Continuity of Care/Discharge Plans
- Mapping to Other Classifications (ICD9, ICD10)
- Meaningful Use
- Not Applicable

Other (please specify)

3. List the type of system users. (Check all that apply)

- Clinicians
- Researchers
- Health Policy Makers
- Administrators/Management
- Information Technologists
- Medical Records/Health Information Management Specialists
- Patients
- Educators

Other (please specify)

IHTSDO Short Survey on Implementation of SNOMED CT

4. Which SNOMED CT hierarchies are you using? (Check all that apply)

- Don't Know
- All
- Clinical Findings
- Disorders
- Procedures
- Body Structures
- Organisms
- Physical Forces
- Substances
- Specimens
- Social Contexts
- Attributes
- Context Dependent Categories
- Physical Objects
- Events
- Observable Entities
- Environments and Geographical Location
- Qualifier Value
- Staging and Scales
- Special Concepts
- Pharmaceutical/Biologic Product
- Record Artifact

5. Are there any terminology specific software tools used in the implementation of SNOMED CT?

Yes

No

If yes, please specify the tools

IHTSDO Short Survey on Implementation of SNOMED CT

6. Are subsets/reference sets of SNOMED CT being used?

Yes

No

If yes, please estimate the number of subsets in use

7. Is any natural language processing or similar technology being used with SNOMED CT?

Yes

No

8. Are SNOMED CT extensions, national or local, being used?

Yes

No

9. Are mappings from SNOMED CT to other terminologies or classifications being used?

Yes

No

10. Do you use a terminology browser for SNOMED CT?

Yes

No

IHTSDO Short Survey on Implementation of SNOMED CT

3. SNOMED CT Implementation Details

11. Please indicate your usage of terminology browsers

	Use Extensively	Use Occasionally	Never Use
CliniClue (http://www.cliniclue.com)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NCI Terminology Browser (http://nciterms.nci.nih.gov/NCIBrowse)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SNOB (http://snob.eggbird.eu)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SnoFlake (http://snomed.dataline.co.uk)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Virginia Tech Browser (http://terminology.vetmed.vt.edu/SCT/menu.cfm)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please specify the browser

12. Do you have an automated coding of free text to SNOMED CT?

Yes

No

13. Does your organization benefit from the use of SNOMED CT?

No Benefit

Moderate Benefit

Not Yet Implemented

Little Benefit

Large Benefit

Don't know

Some Benefit

Very Large Benefit

14. Rate the user acceptance of the implementation of SNOMED CT.

No Acceptance

Moderate Acceptance

Not Yet Implemented

Little Acceptance

Large Acceptance

Don't Know

Some Acceptance

Very Large Acceptance

15. Rate the level of difficulty you experienced in implementing SNOMED CT.

Very Easy

Moderately Difficult

Not Yet Implemented

Easy

Difficult

Don't Know

Moderately Easy

Very Difficult

IHTSDO Short Survey on Implementation of SNOMED CT

16. How would you rate the availability and quality of information relating to implementing SNOMED CT?

None Available

Moderately Poor

Excellent

Very Poor

Moderately Good

Poor

Good

17. Are you aware of the resources available from the International Health Terminology Standards Development Organisation (IHTSDO)?

Yes

No

18. Would you be willing to accept a followup regarding the topics in this survey? (Your agreement does not affect the confidentiality of your responses)

Yes

No

3. SNOMED CT Implementation Details

19. If you are willing to participate in a follow up survey, what would you prefer? (Check all that apply)

- Phone Survey
- Online Survey (Web Based)
- By Email and Structured Forms
- Not Interested

If you selected phone survey, please provide your preferred contact number

20. Would you like to know more about SNOMED CT and its use?

- Yes
- No

21. Other comments/feedback?

Thank you for participating in this survey. Please email sla@ihtsdo.org if you have questions.
Please visit www.ihtsdo.org for more information on SNOMED CT or IHTSDO.

Appendix 2

Details of Individual Projects

Respondent ID	Name of Project	Type of Project	Extent of Implementation	Implementation Phase of Project	Project will be Implemented in Facilities	Time Frame of Implementation (to Production)	Budget for Implementation
1200426696	Generative Clinical Information Management System (GCIMS)	Pilot	Regional	Construction	Hospital and Research	In Production Now	\$100,000 to \$1M
1200426696	Clinical Data Analytics Language (ClinDAL)	Proof of Concept	Local	Construction	Hospital, Independent Laboratory and Research	Less than 1 Year	\$100,000 to \$1M
1200426696	Intelligent Clinical Notes System (ICNS)	Proof of Concept, Pilot	Local	Construction	Hospital and Research	Less than 1 Year	Less than \$100,000
1200426696	Intensive Care Real-Time Audit Information System (ICRAIS)	Proof of Concept	Local	Construction	Hospital and Research	Less than 1 Year	Less than \$100,000
1205940458	Summary Care Record	Production	Regional	Maintenance	Hospital and Physician Group	In Production Now	Don't Know
1205940458	Choose and Book	Production	National	Maintenance	Hospital and Physician Group	In Production Now	Don't Know
1205940458	Emergency Room Dataset	Pilot	Local	Maintenance and Construction	Hospital and Physician Group	In Production Now	Don't Know
1205943549	CliniClue Xplore Development	Production	No Response	Maintenance	No Response	In Production Now	\$100,000 to \$1M
1205943549	CliniClue API Delivery to Clients	Production	No Response	Maintenance	No Response	In Production Now	\$100,000 to \$1M
1206141340	iSoft Patwin	Pilot	Local	Maintenance	Hospital	Less than 1 Year	Less than \$100,000
1206141340	Telepathology Portal	Production	Regional	Maintenance	Public Health Organization	In Production Now	\$100,000 to \$1M
1206141340	Patient Medical Record	Production	Local	Construction	Hospital	1 to 2 Years	\$100,000 to \$1M
1206179795	Public Health Laboratory Interoperability Project (PHLIP)	Production	National	Maintenance	Public Health Organization	In Production Now	Don't Know
1206306274	Interface Terminology for Intensive Care	Pilot	Local	Analysis	Hospital and Research	3 to 5 Years	\$100,000 to \$1M
1206306274	Subset Preoperative Assessment	Proof of Concept	National	Design	Physician Group	1 to 2 Years	\$100,000 to \$1M
1206398346	GELLO Engine IDE	Pilot	Local	Design	Hospital, Physician Group, Independent Laboratory	In Production Now	Less than \$100,000
1206398346	Medical Objects Explorer	Production	National	Maintenance	Hospital, Physician Group, Independent Laboratory	In Production Now	Less than \$100,000
1206398346	Lymphoma Wizard	Proof of Concept	Local	Construction	Hospital, Physician Group, Independent Laboratory	In Production Now	Less than \$100,000
1206830934	Multiple Research (Auditing) Projects under NIH Grants	All Phases	Local	Multiple phases	Research	Less than 1 Year and Greater than 5 Years	Less than \$100,000

1207010940	Med-Access EMR	Production	Local	Maintenance	Physician Group	In Production Now	Less than \$100,000
1207092579	National Quality Registry for Heart Failure	Proof of Concept and Pilot	National	Maintenance	Hospital and Physician Group	In Production Now	Don't Know
1207092579	National Follow-Up of Infections Complicating Medical Care	Pilot and Production	National	Analysis, Design, Construction	Hospital and Physician Group	Less than 1 Year	Don't Know
1207092579	Snomedisation of further National Quality Registries	Pilot and Production	National	Planning	Hospital and Physician Group	1 to 2 Years	Don't Know
1207100121	SNOMED CT in Primary Care Project	Proof of Concept, Pilot, Production	National	Planning, Analysis, Design, Construction	Hospital, Physician Group, Public Health Organization, Research	In Production Now	Greater than \$3M
1207100121	IHTSDO Pre-coordination Roadmap Project Group	Proof of Concept, Production	National	Planning, Analysis	Hospital, Physician Group, Independent Laboratory, Public Health Organization, Patient-Driven Organization, Research	Less than 1 Year	Don't Know
1207164672	Millennium Global Village-Network	Production	Local	Construction	Public Health Organization, Research	In Production Now	\$100,000 to \$1M
1207267251	Research	Proof of Concept, Pilot	Local	Planning, Analysis, Design, Construction, Maintenance	Hospital, Physician Group, Research	In Production Now	\$100,000 to \$1M
1207267251	Education	Proof of Concept	Local	Analysis, Design	Hospital, Physician Group, Independent Laboratory, Public Health Organization, Patient-Driven Organization, Research	In Production Now	Less than \$100,000
1207295863	Natural Language Processing	proof of Concept, Pilot, Production	National	Construction	Hospital	No response	Don't Know
1207295863	Problem List Management	Pilot	National	Design	Hospital	No response	Don't Know
1207295863	Quality Measures	Proof of Concept	National	Construction	Hospital	No response	Don't Know
1207295863	Decision Support	Production	National	Construction	Hospital	No response	Don't Know
1207443638	Terminology Services	Production	National, Regional, Local	Maintenance	Hospital	In Production Now	Less than \$100,000

1207443638	Multiple Client Implementations	Pilot, Production	National, Regional, Local	Planning, Analysis, Design, Construction, Maintenance	Research	In Production Now, Less than 1 Year	\$100,000 to \$1M
1207568527	EpicCare Ambulatory EHR	Production	National	Planning, Analysis, Design, Construction, Maintenance	Physician Group	In Production Now	Decline to State
1207568527	EpicCare Inpatient EHR	Production	National	Planning, Analysis, Design, Construction, Maintenance	Hospital	In Production Now	Decline to State
1207568527	Epic ASAP EDIS	Production	National	Planning, Analysis, Design, Construction, Maintenance	Hospital	In Production Now	Decline to State
1211387677	NSW Health implementation of Cerner FirstNet	Production	Regional	Maintenance	Hospital	In Production Now	Decline to State
1213095126	Assessment Projects	Pilot, production	Regional	Maintenance	No Response	In Production Now	Don't Know
1213194724	SNOMED Search Engine	Proof of Concept	Local	Maintenance	Hospital	In Production Now	Less than \$100,000
1213194724	SNOMED DRG Coupling	Pilot	Regional	Maintenance	Hospital	In Production Now	Less than \$100,000
1219516253	Reasons for Admission in Intensive Care	Pilot	Local	Design	Hospital	1 to 2 Years	Less than \$100,000
1219516253	Information Management in Gastrointestinal Oncology	Proof of Concept	Local	Planning	Hospital	3 to 5 Years	Less than \$100,000
1219715507	VOC (and MedForYou/Unani)	Production	National	Maintenance	Patient-Driven Organization	In Production Now	Don't Know
1221163890	Auditing of SNOMED	Proof of Concept, Enhancement	Local	Analysis, Design	Independent Laboratory, Research	Less than 1 Year	\$100,000 to \$1M
1221163890	Abstraction of SNOMED using Taxonomies	Proof of Concept, Enhancement	Local	Analysis, Design	Independent Laboratory, Research	Less than 1 Year	\$100,000 to \$1M
1224513762	Health Information Systems	Proof of Concept	National	Analysis, Design	Research	Less than 1 Year	Less than \$100,000

1225201116	Problem List Management	Production	Regional	Design	Hospital, Physician Group	Less than 1 Year	Less than \$100,000
1228846060	CAP Cancer Checklists	Production	National	Construction	Hospital, Public Health Organization, Research	Less than 1 Year	Greater than \$3M
1229246061	MDS in 27 Sri Lankan Government Hospitals (Eastern Province)	Production	Regional	Maintenance	Hospital	In Production Now	\$1M to \$3M
1229246061	MDS in further Sri Lankan Hospitals	Pilot	Local	Construction	Hospital	Less than 1 Year	Less than \$100,000
1229816660	Best Practice	Production	National	Maintenance	Hospital, Physician Group	In Production Now	Don't Know
1229933626	Spinal Cord Injury	Proof of Concept	National	Design	Hospital	Less than 1 Year	Less than \$100,000
1231054229	SmartTermer	Proof of Concept	Local	Construction	Hospital, Physician Group, Independent Laboratory, Research	Less than 1 Year	\$100,000 to \$1M
1231054229	SmartCoder	Proof of Concept	Local	Construction	Hospital	Less than 1 Year	\$100,000 to \$1M
1235771978	3M Dialect	Production	National	Maintenance	Hospital	In Production Now	Don't Know
1254682316	NPEX - The National Pathology Exchange	Production	National, Regional	Maintenance	Hospital	In Production Now	\$100,000 to \$1M
1254682316	NLMC - The National Laboratory Medicine Catalogue	Production	National	Maintenance	Physician Group	In Production Now	Less than \$100,000
1254682316	SNOMED Browser www.snomedbrowser.com	Production	National	Maintenance	Research	In Production Now	Less than \$100,000

Appendix 3

Comments on the Survey

1. My organisation is collaborating with the UK NHS Data Standards Team, the University of Leeds and a wide range of other organisations on the promotion and dissemination of SNOMED-CT as an international standard. We are supporting researchers at the University of Leeds who are doing competing with research teams internationally to use SNOMED-CT within Natural Language Processing of free text. We are concerned that there are vested interests who have, in the past, obfuscated SNOMED-CT and the motivation behind our work with SnomedBrowser.com is to expose the simplicity and elegance of the SNOMED-CT structure. Our work with the NLMC (Project 2) has been to support clinicians decide on meaningful subsets of SNOMED-CT that can be used as national standards for implementation (via the UK National NHS projects) and as code mapping between disparate legacy systems (project 1). We're very keen to support further efforts by IHTSDO.
2. Regarding current use of SNOMED-CT, we do not have examples of system implementations, only plans to use limited codes if the source system can support or mapping allows.
3. We would like to have sub-sets of SNOMED that cover the WHO essential drug list and the list of notifiable diseases, but don't know how to do it.
4. My colleagues within the Australian E-Health Research Centre have built Snomed browsing/mapping tools (Snapper & Minnow), which are gaining in popularity in Australia and known to some IHTSDO members from other countries.
5. The question on do we use SNOMED CT is vague - we have done subsetting and mapping but have not implemented. We are just starting out and would like to leverage the work and lessons learned from other organizations
6. We do not have an implementation, but we use SNOMED CT on many large scale international research studies for open ended data. Normally, if the case report form calls for "specify" (e.g., clinical finding/body site) or "list other", then we have an online SNOMED search and browse tool that allows the researchers (distributed at over 100 different sites) to enter a SNOMED code versus free text. Many users do not even understand that they are using SNOMED. The data has not been analyzed extensively. But we have been

doing this about 5 years in a variety of disease areas.

7. I participate in the IHTSDO working group meetings so find out great information there.

8. The pure academic aspect (not as an implementation) of SCT is poorly represented in this survey and many of the questions are difficult to answer in that respect.

9. 1. mail is best to contact, the phone number is our technical support office.
2. I said users are happy - this is because they don't see SNOMED. Users become unhappy when people tell them they must use this set of terms or that

10. I am assigned to certain tasks like writing scripts for Data Architect to upload the tables from your flat text files. We are still in the planning stage and I don't know when we will start using SNOMED data in production.