



ANALYSIS OF DENTAL PROCESS AND PROCEDURE USING SNOMED CT AND MY-HARMONY

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CONTENT

- SNOMED CT Implementation Progress
- Development of Dental Reference Set
- Use and analysis of Dental Reference Set (Demo)
- Way forward

IMPLEMENTATION PROGRESS

MEMBERSHIP

12 December 2012

Exploring how to maximize use of SNOMED in Malaysia context

NEW ZEALAND

1. **Data harmonization** and Analytics with SNOMED CT – Updates, Deployment and Integration with warehouse
2. Enhancing user experience using intelligent query recommendation with SNOMED CT

VANCOUVER

SNOMED CT
generating cardiology
key performance
indicators (KPI)

2012-2013

2014-2015

2016

2017

2018

2019

AMSTERDAM/ MONTEVIDEO

1. Performing analytics on SNOMED CT coded database - Serdang Hospital **use-case**

2. Development and implementation of standards in Laboratory Information System (LIS) using **SNOMED CT and LOINC**

POLAND

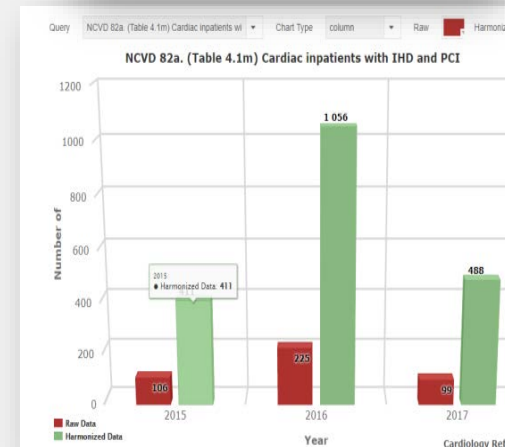
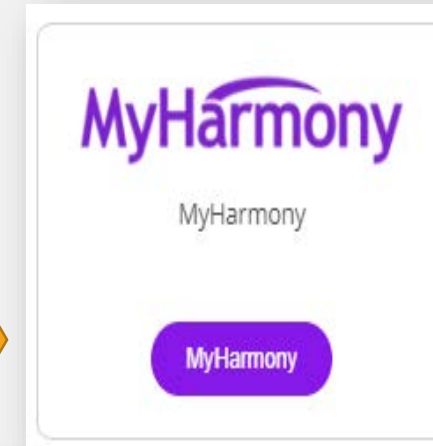
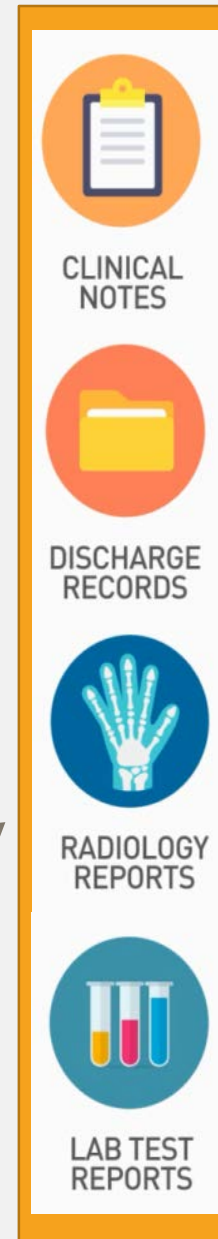
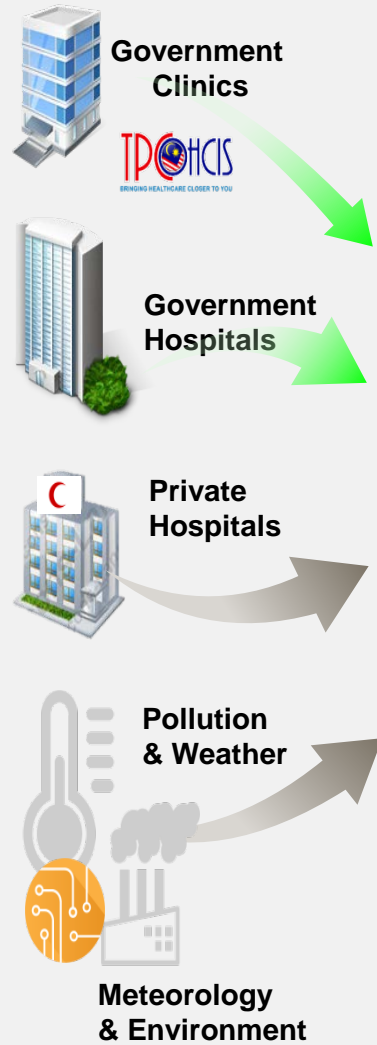
Focusing on:

- Refinement of MyHarmony Engine
- Updating Cardiology Refset

KUALA LUMPUR

1. Analysis of dental process & procedure using SNOMED CT and MyHarmony
2. Integrating MyHarmony (Harmonization & Codification of Unstructured Data using SNOMED CT) with Malaysian Health Data Warehouse

- MyHarmony is an application developed by Health Informatics Centre (HIC) from the Planning Division of Ministry of Health (MoH) Malaysia and MIMOS.
- To codifies and harmonize free-texts with SNOMED CT using Natural Language Processing technique.
- Using Cardiology Reference Set and discharge summary data, MyHarmony was able to generate statistical analysis for monitoring Cardiology KPI



DENTAL REFERENCE SET DEVELOPMENT

Step 1. Variables confirmation (Nov-Dec 2018)

- Stakeholders
- Documents: HIMS
- Lists from databases
- Type of data needed (clinical/ non clinical)



Step 2. Mapping (January 2019)

- Confirmed variables map to SNOMED CT Concept ID



Step 3. Validation (Feb-March 2019)

- Concerns and issues occurs during the mapping process confirmed and resolved by stakeholders.

CHALLENGES IN DEVELOPING REFSET

1. Various specialities and overlapping procedures in practices.
2. Definition of procedure vs clinical processes/steps
3. Multiple diagnosis and/or procedures in single visit
4. Granularity of data collected

I. VARIOUS DENTAL SPECIALITIES

- Unknown to many, there are various dental specialities available.
- Certain processes/procedures conducted as general practices (general dentist + specialist can performed), others are limited to specialist (in Malaysia public service/MoH context).
- Example of processes:

Area	Process/Procedure in General Practices	Process/Procedure in Specialist
Periodontics	Full mouth scaling	Periodontal Surgery
Orthodontics	Removable appliances (limited)	Fix orthodontic appliances
Restorative	Dental Fillings	Crown and bridges

VARIOUS DENTAL SPECIALITIES

NO	HOSPITAL BASED SPECIALITIES	NON-HOSPITAL BASED SPECIALITIES
1	Oral Maxillofacial Surgery (359)	Primary Care and Dental Public Health (12)
2	Paediatric Dentistry (112)	Orthodontic (89)
3	Oral Pathology and Oral Medicine (34)	Restorative Dentistry (97)
4	Forensic Dentistry (28)	Periodontics (29)
5	Special Needs Dentistry (13)	Others Process (23)
Add	Supporting terms eg: tooth number, surfaces, anatomical landmark (151)	

Solution: Assigned procedure owner to specialities for mapping purpose. In ()= item mapped.

2. PROCESSES VS PROCEDURE

- The difference between processes and procedures can be summed up as **breadth and depth**.
- A **process** defines the **big picture and highlights the main** elements of your business—breadth. A **procedure** captures those **elements and adds more information** for functional responsibilities, objectives, and methods—depth.

(ISO 9001:2015)

- However, in clinical work documentation, both terms were use **interchangeably** resulting difficulty in mapping.
- It's also **related to workload of the dentist and specialist**. Many reports captures the process, not the procedure. The procedures were not reported (manual data collection).
- However, many man-hours spent for conducting this procedure. Therefore, lost of data.

PROVISION OF VENEER

Data Needed	Clinical Procedure Documented	SNOMED CT CONCEPT ID
	Tooth Preparation	Not mapped
	Impression Taking	Not mapped
	Working Model	Not mapped
Number of Veneer issued	Insertion of Veneer Porcelain	234803005 Fit veneer to tooth (procedure) + 256480008 Dental porcelain material (substance)
Number of Veneer issued	Placement of Veneer Composite	PC: 234803005 Fit veneer to tooth (procedure) + 256452006 Composite dental filling material (substance)

PROCESS FOR PLACEMENT OF DENTAL CROWN



Data Needed	Clinical Procedure Documented	SNOMED CT CONCEPT ID	
Number of patient	Not related		Visit 1
	Tooth Preparation	Not mapped	
	Impression Taking	Not mapped	
	Provision of temporary crown	Not mapped	
Number of crown issued	Insertion of dental crown	32349008 Restoration, crown, porcelain fused to high noble metal (procedure)	Visit 2
	Patient review	Not mapped	Visit 3

PROCESS FOR FIX ORTHODONTIC APPLIANCES

Data Needed	Clinical Procedure Documented	SNOMED CT CONCEPT ID	
Number of patient	Not related		
	Consultation+ Impression Taking	Not mapped	Visit 1
	Separator placement	Not mapped	Visit 2
Number of patient	Fix appliances placement	55656007 Fixed appliance therapy (procedure)	Visit 3
	Patient review	Not mapped	18-24 months
	Removal of Fix appliances	303609002 Complete removal of fixed orthodontic appliance (procedure)	Visit 4

3. MULTIPLE DIAGNOSIS AND/OR PROCESS IN SINGLE VISIT.

- In one dental appointment, the dentist examined the soft tissue of oral cavity (tongue, buccal mucosa, palate, gingiva, etc) and the teeth.
- All element can be diagnosed differently.
- Therefore, many diagnosis and work process can be conducted in a single visit.
- However, no single main process/main procedure can be assigned since it is a different process for each individual teeth/soft tissue site (all are main procedure for different body site).

MULTIPLE DIAGNOSIS AND/OR PROCESS IN SINGLE VISIT.

Data Needed	Diagnosis (In Single Visit)	Treatment provided
No of patient treated	Not related	Not related
No of scaling done	Calculus on multiple teeth and quadrant	Full mouth scaling done
No. of Amalgam Filled Tooth	Caries on 36 Occlusal	Amalgam Filling placed
No. of Amalgam Filled Tooth	Caries on 37 Occlusal	Amalgam Filling placed

4. GRANULARITY OF DATA COLLECTED

- Extent of granularity needed in reports:
 - Types of tooth (anterior/posterior vs permanent/deciduous)
 - Types of filling materials (composite resin, glass ionomer cements, etc)
- In order to capture this data, we mapped 151 supporting concept

GRANULARITY OF DATA COLLECTED

Data Needed	Clinical Procedure Documented	SNOMED CT CONCEPT ID
Number of patient	Not related	
Number of deciduous tooth	No procedure mapped	Using count function (based on 151 supporting terms mapped)
Number of permanent tooth	No procedure mapped	Using count function (based on 151 supporting terms mapped)

DENTAL PROCESS AND PROCEDURE REFSET

- With these challenges, we managed to develop the refset.
- Process and procedure: 756 items
- Supporting terms: 151 items
- New concepts request: 31 items

**DEMO MYHARMONY USING DENTAL
PROCESS AND PROCEDURE REFSET**

WAY FORWARD

- Refinement of the process and procedure list.

THANK YOU