Government initiatives

SNOMED and GS1: Harmonising standards to benefit New Zealand healthcare

Globally, the Systemised Nomenclature of Medicine - Clinical Terms (SNOMED CT) and GS1 standards uniquely identify medicines, using standardised numbers for both clinical and supply chain purposes. Work is underway to harmonise and make these systems interoperable. The New Zealand Health Information Standards Organisation (HISO) has mandated a national medicines terminology for New Zealand and defined standards for using SNOMED CT and GS1 Global Trade Item Numbers (GTINs) to manage health information and enhance clinical decision-making outcomes. The challenge is to drive efficiencies and improve outcomes by harmonising GS1 and SNOMED CT standards. A first step is a cross listing of New Zealand Medicines Terminology (NZMT) and GTIN-based information into both their respective clinical and supply chain systems. Through a pilot involving a sample selection of pharmaceutical manufacturers, GS1 and the New Zealand Universal List of Medicines (NZULM) have demonstrated that GSI and SNOMED CT identifiers can be harmonised and leveraged to benefit the NZ healthcare sector through enhanced, more informed clinical decision-making, leading to improved patient safety outcomes. Learnings from this pilot and recommendations for the rollout of the pilot to all suppliers are presented.

NZULM

By David Mitchell

Introduction

Leveraging international best practices

Internationally, two major not-for-profit standards development organisations have worked collaboratively to implement and support global standards for clinical and supply chain purposes.

SNOMED International develops and administers the SNOMED CT terminology, which provides standardised clinical terminologies and concepts.

GS1 is the "global language of business" that enables unique identification, data capture and sharing of that data to increase supply chain efficiency and service delivery.[1]

In 2010, SNOMED International and GS1 signed a Memorandum of Understanding and agreed to collaborate to make their respective systems harmonised and compatible.[2]

1 *GS1 New Zealand Profile document*

2 *SNOMED International briefing paper, 5 August 2015*

Through a pilot involving a sample selection of pharmaceutical manufacturers, GS1 and the New Zealand Universal List of Medicines (NZULM) have demonstrated that GSI and SNOMED CT identifiers can be harmonised and leveraged to benefit the NZ healthcare sector through enhanced, more informed clinical decision-making, leading to improved patient safety outcomes.

In 2013/14, GS1 and SNOMED International agreed to develop principles for linking SNOMED CT and GTINs within a country.[2]

Most recently, in April 2016, a new collaborative agreement between GS1 and International Health Terminology Standards Development Organisation (IHTSDO) was signed to support the interoperability of health information systems globally.[3]

The objective was to facilitate links between the clinical information in clinical records (SNOMED CT) and point of care systems (using GTINs), to ensure patients receive the correct medicine.[3]

Applying at a national level

This case study outlines a New Zealand pilot project between GS1 and the New Zealand Universal List of Medicines to harmonise clinical and supply chain-related systems in the healthcare sector.

The Health Information Standards Organisation supports and promotes the development and adoption of health information standards for the health system.[4] HISO links with the international standards community through:

- SNOMED International for SNOMED CT
- HL7 New Zealand for HL7 standards
- GS1 New Zealand for GS1 supply chain standards[4]

HISO has endorsed:

- SNOMED CT as the national clinical terminology.[5] As part of this, HISO mandated the development of the New Zealand Medicines Terminology (NZMT) within the NZULM as the national SNOMED CT based medicines terminology.
- GS1 standards for automated product identification for all medicines, including barcodes, the GTIN product identifier and other associated data definitions (commonly referred to as Application Identifiers or AIs).[6]

Recently, HISO also endorsed to:[7]

- Use the GTIN as the medical device identifier for all supply chain purposes.
- Support the programme to develop a unique device identifier (UDI) standard based on the GTIN as the device type identifier.
- Support the SNOMED International project to develop a medical device model and terminology using SNOMED CT.
- Establish a SNOMED CT-based medical device terminology for clinical documentation and decision support.
- Record GTIN and other UDI data elements (e.g., the Global Location Number or GLN) in clinical documentation for product traceability.

HISO intends these initiatives to ensure that medical devices can be safely prescribed, dispensed and administered and be properly ordered, distributed and tracked.[7]

Most recently, in April 2016, a new collaborative agreement between GS1 and International Health Terminology Standards Development Organisation (IHTSDO) was signed to support the interoperability of health information systems globally.

3 *"New Global Collaboration between GS1 and SNOMED International" press release, 22 April 2016*

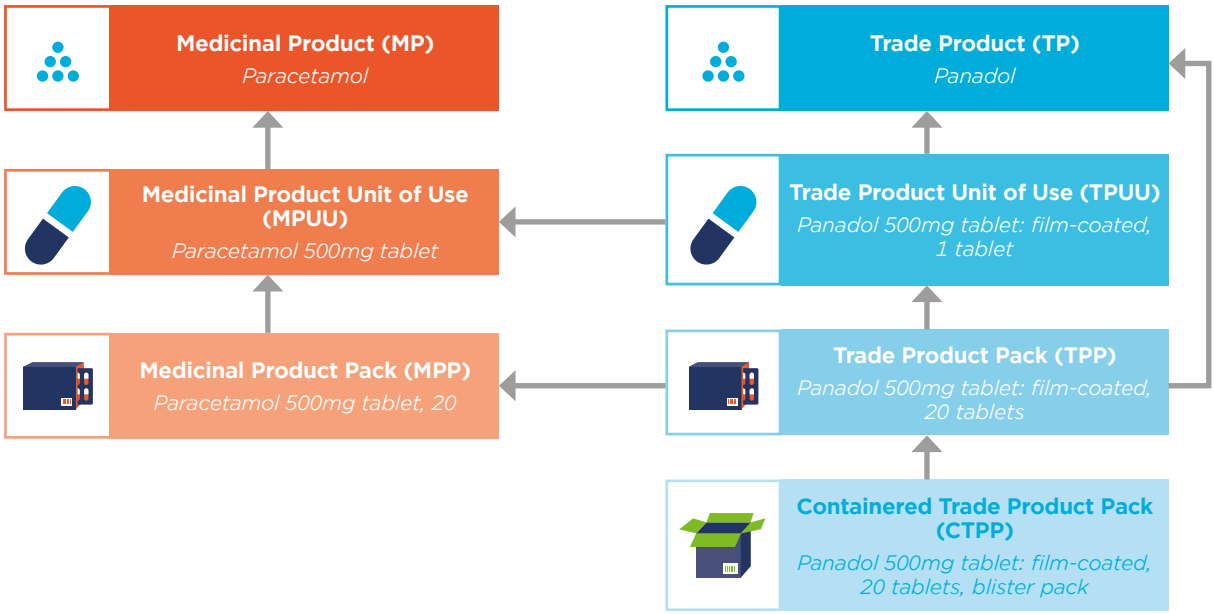
4 *HISO website, http://healthitboard.health.govt.nz/health-it-groups/health-information-standards-organisation-hiso*

5 *http://healthitboard.health.govt.nz/standards/endorsed-standards/snomed-ct-endorsement*

6 *http://healthitboard.health.govt.nz/standards/endorsed-standards/gs1-standards*

7 *Medical Device Terminology and Identification Standards, http://healthitboard.health.govt.nz/hiso-1002422016-medical-device-terminology-and-identification-standards*

New Zealand Medicines Terminology Structure



Standards-based New Zealand healthcare initiatives

The New Zealand Universal List of Medicines (NZULM)

The NZULM provides the national medicine list and associated core information about those medicines including indications, contra-indications, adverse effects and dose forms.

The NZULM currently combines product information from:

- New Zealand Medicines Terminology
- Medsafe (medicine regulatory information)[8]
- PHARMAC (medicines subsidy information)[9]
- Pharmacode (a proprietary New Zealand pharmacy product identifier)[10]
- Supplier data

The NZMT data model has seven concepts allowing medicines to be described and identified at all levels of abstraction.

The containered trade product pack (CTPP) describes the physical product and is the point of linkage between the NZULM conceptual world and the physical world.

The National Product Catalogue (NPC)

GS1 New Zealand's implementation of the GS1 Global Data Synchronisation Network (GDSN) is known as the National Product Catalogue. Suppliers load item master data information into the NPC and then publish it to their data recipient(s). The NPC is based on GS1 standards, with the GTIN as the mandatory product identifier.

Challenge

The challenge is to connect the New Zealand clinical and supply chain worlds and drive greater efficiencies and better outcomes for the healthcare sector by harmonising and integrating GS1 and SNOMED CT standards.

The key to harmonising the data sources is for GS1 New Zealand and NZULM to incorporate the CTPP SCTID and GTIN in their respective databases.

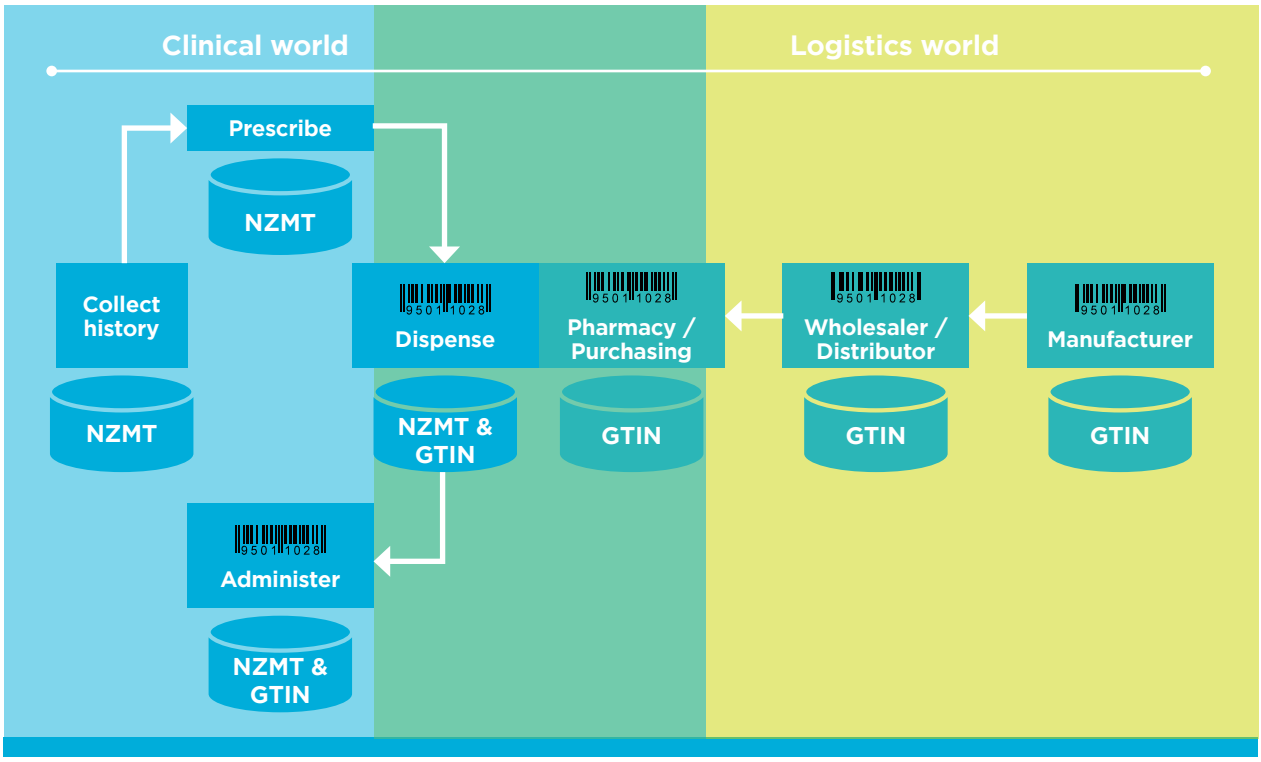
8 *Medsafe - New Zealand Medicines and Medical Device safety Authority – www.medsafe.govt.nz*

9 *PHARMAC – Pharmaceutical Management Agency - www.pharmac.govt.nz*

10 *Pharmacode is administered by the New Zealand Pharmacy Guild – www.pgnz.org.nz*

Solution

The interface between the NZULM and GS1 can be summarised in this way: [11]



The key to harmonising the data sources is for GS1 New Zealand (GS1NZ) and NZULM to incorporate the CTPP SCTID and GTIN in their respective databases. Mandatory listing of CTPP SCTID in the NPC and GTIN in the NZMT tab will be the first step in creating a link between the NZULM and GS1NZ[12]. These key data elements form the bridge between the two systems and open the way for more extensive mapping of the NZULM and NPC listings in the future.

Harmonisation pilot project

GS1NZ and the NZULM collaborated to test the process of integrating supplier product and market data from the GS1 National Product Catalogue into the NZULM clinical database.

Project objective and expected benefits

The overall objective is to enhance patient and clinician safety in the future by improving medication management, dispensing and medicine administration at point of care. The immediate objective was to create reference data that serves both clinical and supply chain purposes.

The main benefits of undertaking the project are to provide the following: [13]

- Greater value for existing suppliers on the NPC. Pharmaceutical suppliers who currently have data loaded to the NPC will be able to publish their product information to the NZULM.
- Greater value for existing users of the NZULM. Accessing market and product information from the NPC via the NZULM will make clinical systems easier to use and provide greater utility.
- Enhanced patient and clinician safety when administrating medication and improve stock management.

11 Mitchell, David, "NZULM: GS1Net harmonisation" presentation, GS1 Healthcare User Group Conference, September 2015

12 SNOMED CT Identifier for a product from the NZULM.

13 Project scope document, business case section, 30 January 2015

Implementation approach and progress

The pilot project involved three phases:

Phase 1: Access, set up and testing. During this phase, the NZULM was set up as a data recipient of the NPC. While the overall aim was for multiple data attributes to be incorporated into the NZULM database, the importation of GTINs took priority, with other attributes to be agreed upon and incorporated at a later stage. Likewise, the CTTP SCTID was identified as the key attribute, which suppliers needed to complete and populate in the NPC. The CTPP SCTID will match the NPC data associated with a GTIN to the NZMT in the NZULM database. GS1 New Zealand provided support by downloading the test data from the NPC for importing into the NZULM. The aim was to assess the upload process and review the data presentation in the NZULM database.

Phase 2: Training and utilisation of the NPC recipient (NPC-R). GS1NZ trained NZULM personnel to download supplier data from the NPC using what is known as the "NPC recipient tool." Workload concerns led the NZULM to a decision to use a sFTP connection. This connection ensures electronic messaging of item master data updates would be automatically placed into the NZULM sFTP mailbox. This process is still in pilot mode and as such has not been fully utilised. Additional training will be provided by GS1 New Zealand to enable the NZULM team to interpret NPC XML messages and incorporate them into their NZULM database.

Phase 3: Collaboration with suppliers. A small sample of pharmaceutical suppliers with existing NPC catalogues were identified and invited to participate in the pilot project. These suppliers were chosen because of the quality and volume of their data in the NPC. They were each asked to add the CTPP SCTID code, under the Medsafe Regulatory Classification field, against each of the GTINs in their NPC catalogue and were provided training by GS1 New Zealand on how to publish to the NZULM as a data recipient.

The result was the incorporation of previously unpublishable GTINs into a newly introduced data field in the NZULM, along with the existing CTPP SCTID code.

Learnings from the pilot project

To date, key learnings from the project are:

- **Supplier understanding of the NZULM is limited.** Consequently, the NZULM will now likely provide a supplier guide and a "getting started" pack to educate and empower suppliers to verify NZULM-to-NPC mappings for their products.

- **Managing data quality is a critical, but a time-consuming task.** The process of assisting suppliers to map product listings was refined as the pilot progressed. The most efficient approach was for the NZULM to provide a list of NZULM listings and CTPP SCTID codes for the supplier. This made it easier for suppliers to populate the field in their NPC catalogue, and subsequently publish data to the NZULM. The NZULM also highlighted the need to support suppliers with difficult to map products. Data errors[14] can occur, especially where the product identifier data is manually entered into the systems. Importantly, a system to electronically upload data as well as a quality management system is needed to prevent errors entering both databases.

- **New business processes are required.** Not all products have NZULM listings and it is important to add new NZULM listings when gaps are identified. In the long-term, a new process of incorporating medicine registration and GTIN allocation, and importation into the NZULM could streamline the overall process for suppliers.

Future steps

The next step is to develop a strategy and framework for rolling out this initiative to the wider healthcare community. The key themes for improving the process include:

1. Define the future NZULM data set

The additional NPC attributes to be provided to the NZULM in future will be determined. They are expected to include the following NPC supplier data elements:

- Product availability dates
- Expiry date
- Trade item description
- NZ Business Number (NZBN, which is essentially a GLN)

14 Between 2% and 5% in the test series.

2. Provide suppliers with assistance

Reducing supplier workload is essential. Providing a supplier process guide, a list of pre-mapped medicines for verification where possible, training to understand the NZULM and management of any data gaps will lessen the burden on suppliers.

3. Make better use of the NPC recipient tool and sFTP mailbox

GS1 and NZULM will work together to enhance NZULM skills on downloading data from the NPC recipient tool, subscribing to suppliers' NPC catalogues and using the sFTP mailbox to manage supplier updates efficiently. The NZULM will develop tooling to accept updated data and incorporate it into their database automatically.

4. Business process development for mapping is needed

To ensure correct mappings between CTPP SCTID and GTIN, a quality control process will be developed to cover the various use case scenarios (e.g., new, obsolete listings). This will take into account the full workflow processes from suppliers applying for consent to distribute right through to incorporating the additional healthcare attributes into the NPC and importing them into the NZULM database.

Conclusion

The successful sharing of the GTIN between the two systems has demonstrated that GDSN: NZULM interoperability is technically achievable in fulfilling stated clinical and supply chain outcomes. GS1 New Zealand and NZULM have proven that these important standards can co-exist in different systems and interoperate and be leveraged to benefit the entire NZ Healthcare Sector.

The pilot has greatly assisted the international work effort in aligning GS1 and SNOMED standards to develop international guidance principles on linking.

About the Author

David Mitchell *is trained as a pharmacist and has extensive experience in the New Zealand healthcare sector having worked in the pharmaceutical industry, health sector advocacy, and health informatics as well as working for a period in a senior role with Statistics New Zealand. He currently is Lead Terminologist with New Zealand Universal List of Medicines and also practices part-time as a community pharmacist.*

About the Organisations

About SNOMED

SNOMED International is a not-for-profit organisation that owns, administers and develops SNOMED CT. SNOMED CT is a clinical terminology created by a range of healthcare specialists to support clinical decision-making and analytics in software programs.

http://www.snomed.org/

About NZULM

The NZULM is New Zealand's national medicines list for universal use across the health and disability sector. The NZULM provides an up-to-date and trusted, one-stop-shop of core and commonly used information about medicines (and other products and devices where appropriate) for New Zealand. The NZULM brings together medicines information from Medsafe, PHARMAC and the Pharmacy Guild into a single standardised product, utilising the "common medicines language" in the New Zealand Medicines Terminology (NZMT).

http://www.nzulm.org.nz/

About HISO

The Health Information Standards Organisation (HISO) supports and promotes the development and adoption of fit-for-purpose health information standards for the New Zealand health system. HISO works with health providers and shared services organisations, clinical and consumer groups, software vendors and industry bodies, the academic community, the wider government sector and other standards development organisations. HISO links with the international standards community through the International Health Terminology Standards Development Organisation (IHTSDO) for SNOMED CT, and through HL7 New Zealand for HL7 standards.

http://www.health.govt.nz/about-ministry/leadership-ministry/expert-groups/health-information-standards-organisation

Improved clinical and supply chain data for medication management enhance both patient and clinician safety.