Using Snow Owl to Maintain Singapore's SNOMED CT Extension and Drug Dictionary

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(10:45 – 11:30)

MOH HOLDINGS

Agenda

- Introduction to Snow Owl
- Singapore SNOMED CT Extension
  - Background
  - Snow Owl Demonstration
- Singapore Drug Dictionary
  - Background
  - SDD Tooling Demonstration
- Project Timelines

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Snow Owl - Features

- Collaborative terminology authoring platform
  - Terminology
  - Subsets/Reference sets
  - Mapping
- DL classification
- Validation
- Semantic (ESCG/TermInfo) query support
- Concept model backed editing
  - MRCM support
- Task management support (workflow)
- Scripting support
- Terminology server
- Modular and extensible

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Platform Software Architecture

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- Built on the seasoned Eclipse tooling platform with wide industry adoption
  - Composed of bundles running within an OSGi (Eclipse) container
  - Bundles can be deployed depending the product definition (possible for both client and server side)
  - Help and branding information are in separate bundles
- SDD utilizes
  - the services provided by the Snow Owl terminology platform
  - quick search widget UI component
  - Snow Owl's classification module for semantic equivalence checking

Platform Software Architecture

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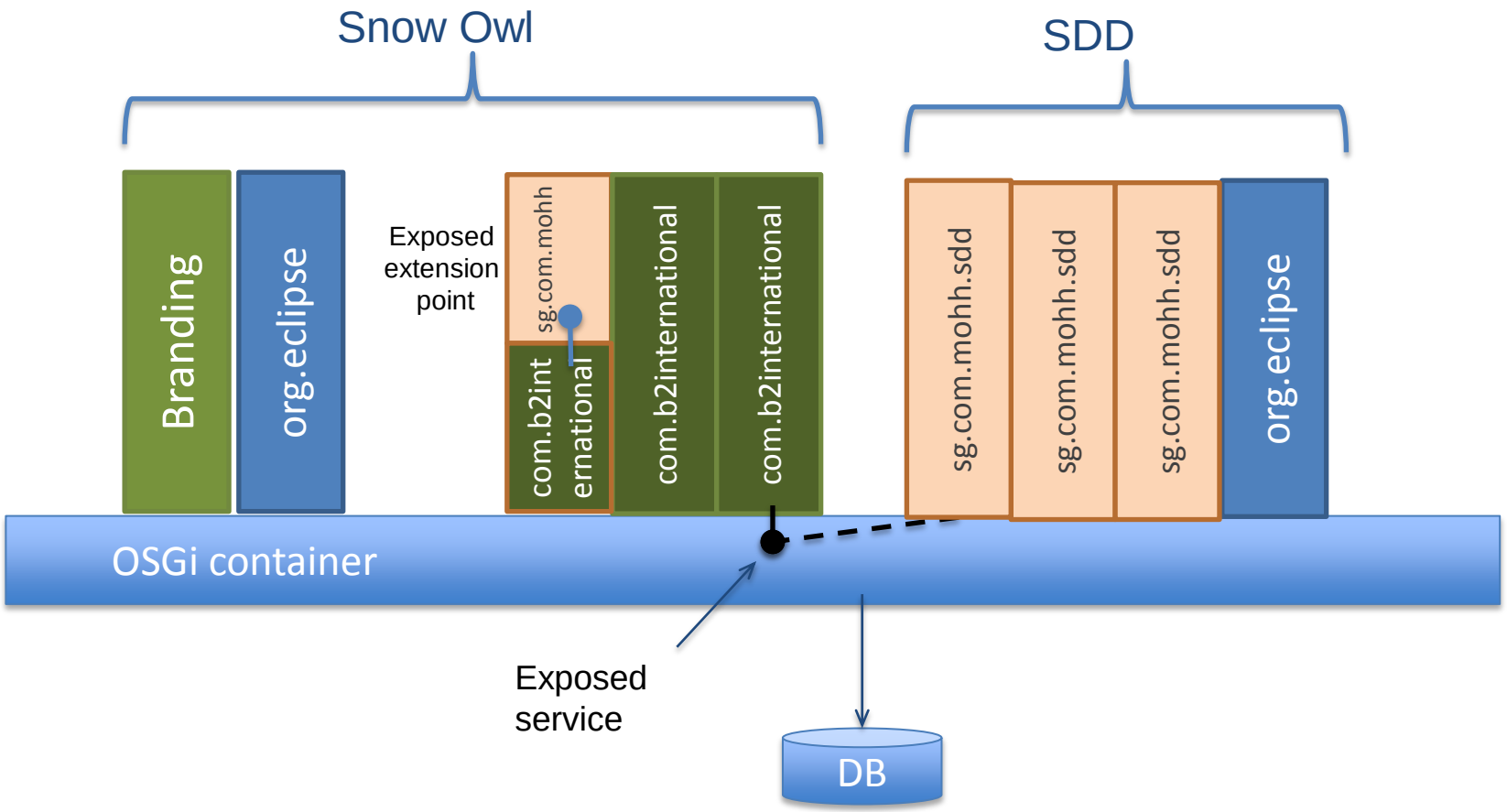
Modularity & extensibility



Platform Standards Stack

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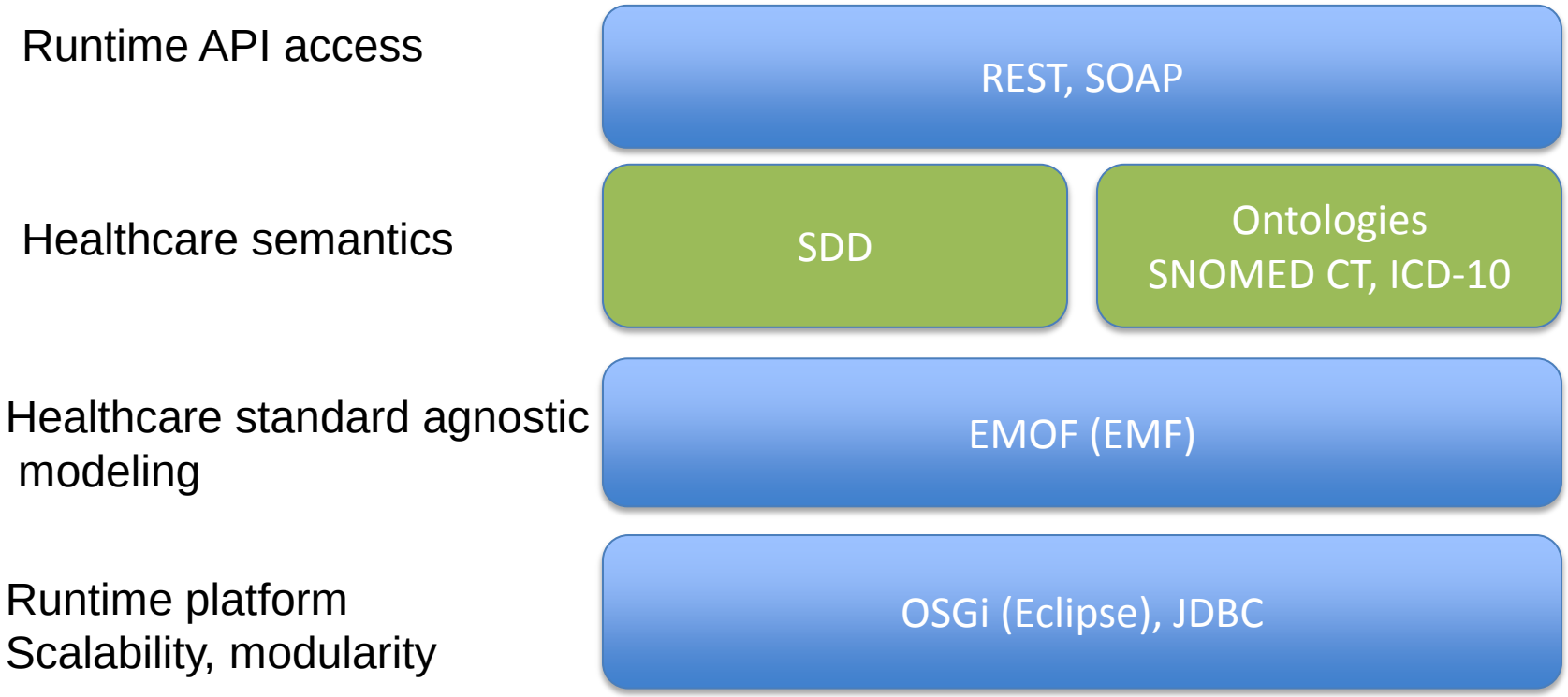


Snow Owl Project Timeline

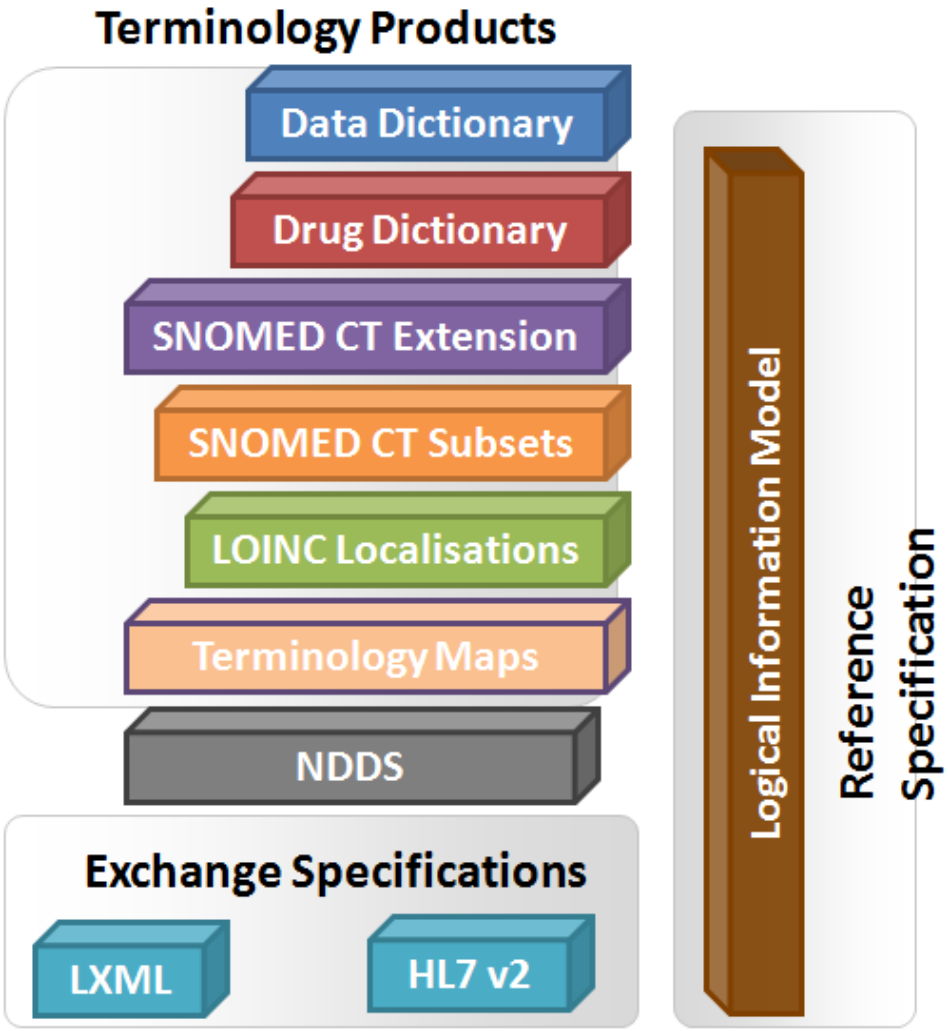
MOH HOLDINGS

- V0: 2010 April - project kick-off
- V2.0: 2012 September 28 – current release
- V3: mid 2013
  - The de-facto integrated tooling platform for BOTH terminology and information modelling authoring
  - Runtime platform for meaningful query

Singapore
Terminology
Development

MOHHoldings Standards Products

- **Diagnosis** - SNOMED CT*
- **Drugs** - Singapore Drug Dictionary (SDD)
- **Allergic Reactions** - SNOMED CT*
- **Allergens** - SNOMED CT* + SDD
- **Laboratory Results** - LOINC (TBD)
- **Data Dictionary** - MOHH Data Dictionary
- **Procedures** - TBD
- **Reason for visit** - SNOMED CT*
- **Symptoms and Problems** - SNOMED CT*
- **Laboratory Reports** - Smart SNOMED CT*
- **Laboratory Orders** - SNOMED CT*
- **Radiology Orders** - SNOMED CT*



SNOMED CT* includes Singapore Extension

Snow Owl Demonstration

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- Browse reference sets
- Add new concepts, relationships and descriptions
- Revision history
- Publication process

Singapore
Drug
Dictionary

Singapore Drug Dictionary (SDD)

A national standard to unambiguously identify, code, describe & interpret medicines.

Needs to meet the diverse requirements of different users and cater for new innovative products.

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SDD Objectives

Improvements in clinical care activities, patient management and safety

- Semantic interoperability across use cases
- Semantic interoperability across care settings
- National / international decision support rules
- Medication safety initiatives including:
  - ✓ Medication management
  - ✓ Adverse drug event surveillance.
- Data mining, analysis and research

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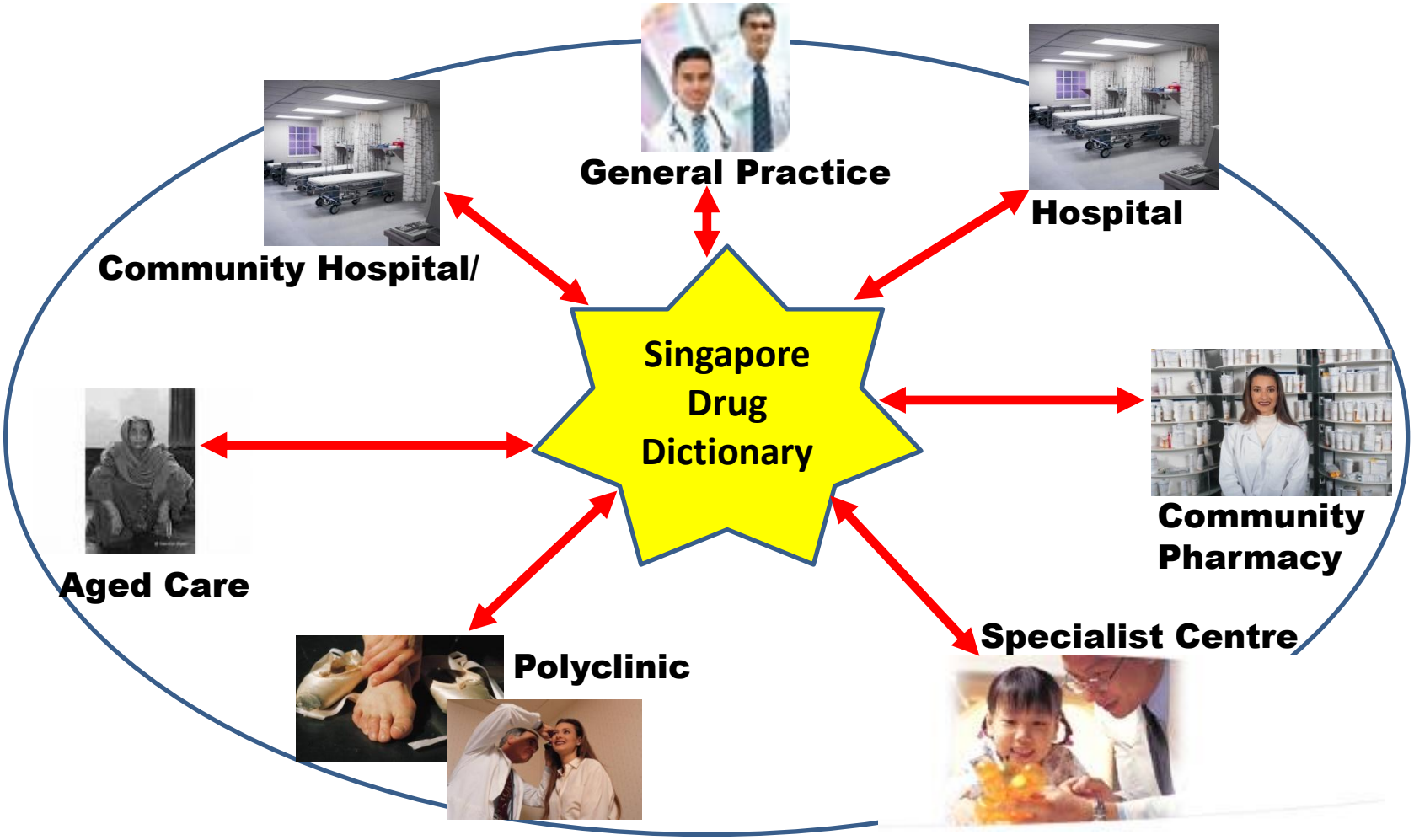
Interoperability Across Care Settings



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Interoperability Across Use Cases

Registration

Inventory Management

Supply Chain

Prescribing

Dispensing

Administration

Medication Lists / Allergies / Research / Decision Support etc

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SDD Principles

The SDD model has been developed with the following principles in mind:

- **Extensibility**
  In both the drug content and data model to allow for innovations in pharmaceutical and device technology over time.
- **Ontology**
  Based on ontological principles to support Singapore's growing need for Biomedical research.
- **Patient Safety, Semantic Interoperability and Decision Support**
  These must be facilitated by the SDD and be the focus of clinician review and initial EMR vendor uptake.
- **Hide Complexity**
  Complexity to be hidden from clinicians and most Electronic Medical Record (EMR) vendors.
- **Informed by Existing Clinical Practice**
  Models tested against several thousand existing medication terms from hospital and GP prescribing/dispensing systems, PRIOR to finalisation of model.

Core Medication Classes

Singapore Medicinal Product (SG product)

Medicinal Product (MP)

is a

Medicinal Product Form (MPF)

Medicinal Product Preparation (MPR)

Medicinal Product Quantity (MPQ)

Medicinal Product Pack (MPP)

Medicinal Product Pack in Container (MPPC)

Medicinal Trade Product (MTP)

is a

Medicinal Trade Product Form (MTPF)

Medicinal Trade Product Preparation (MTPR)

Medicinal Trade Product Quantity (MTPQ)

Medicinal Trade Product Pack (MTPP)

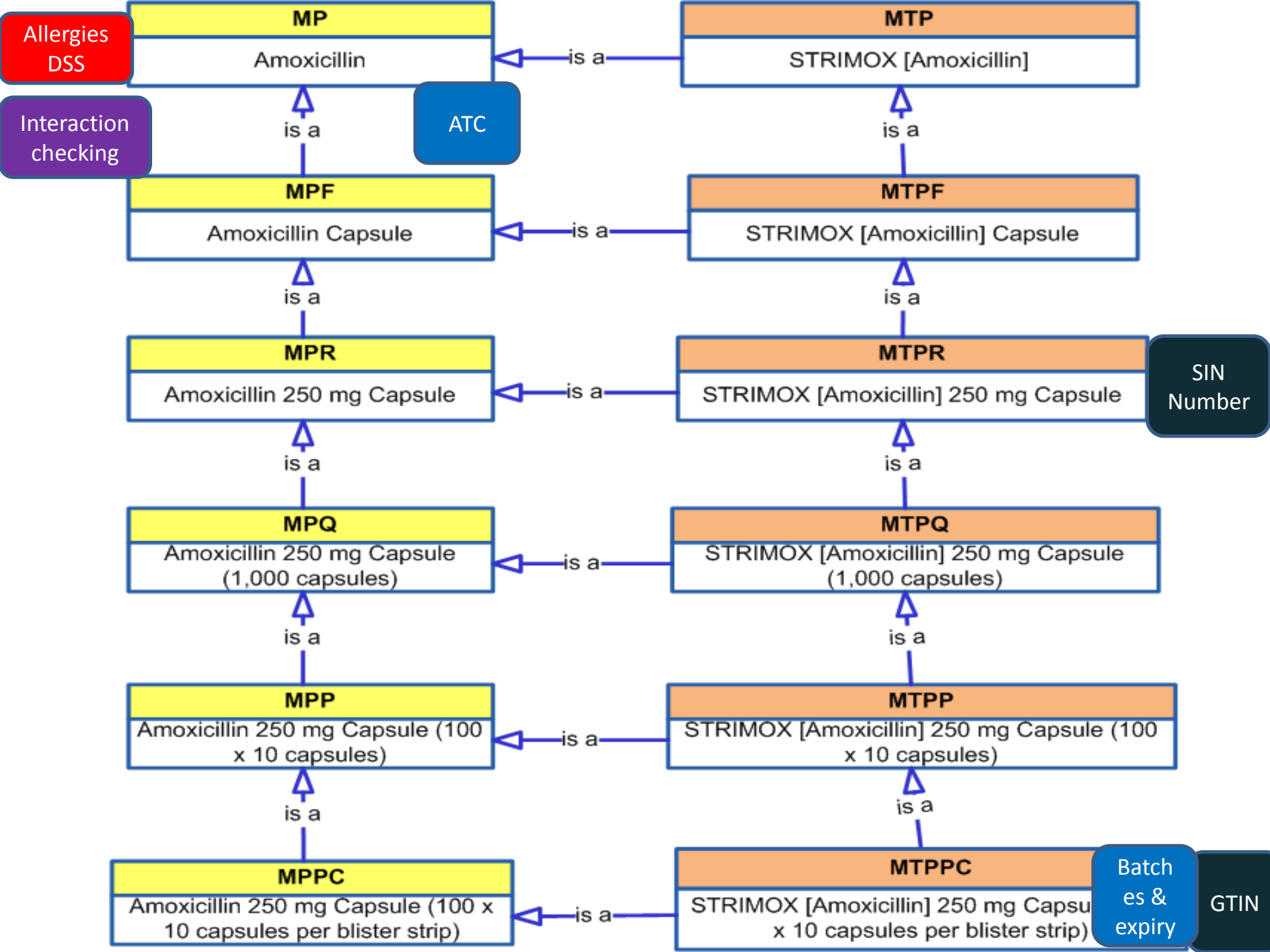
Medicinal Trade Product Pack in Container (MTPPC)

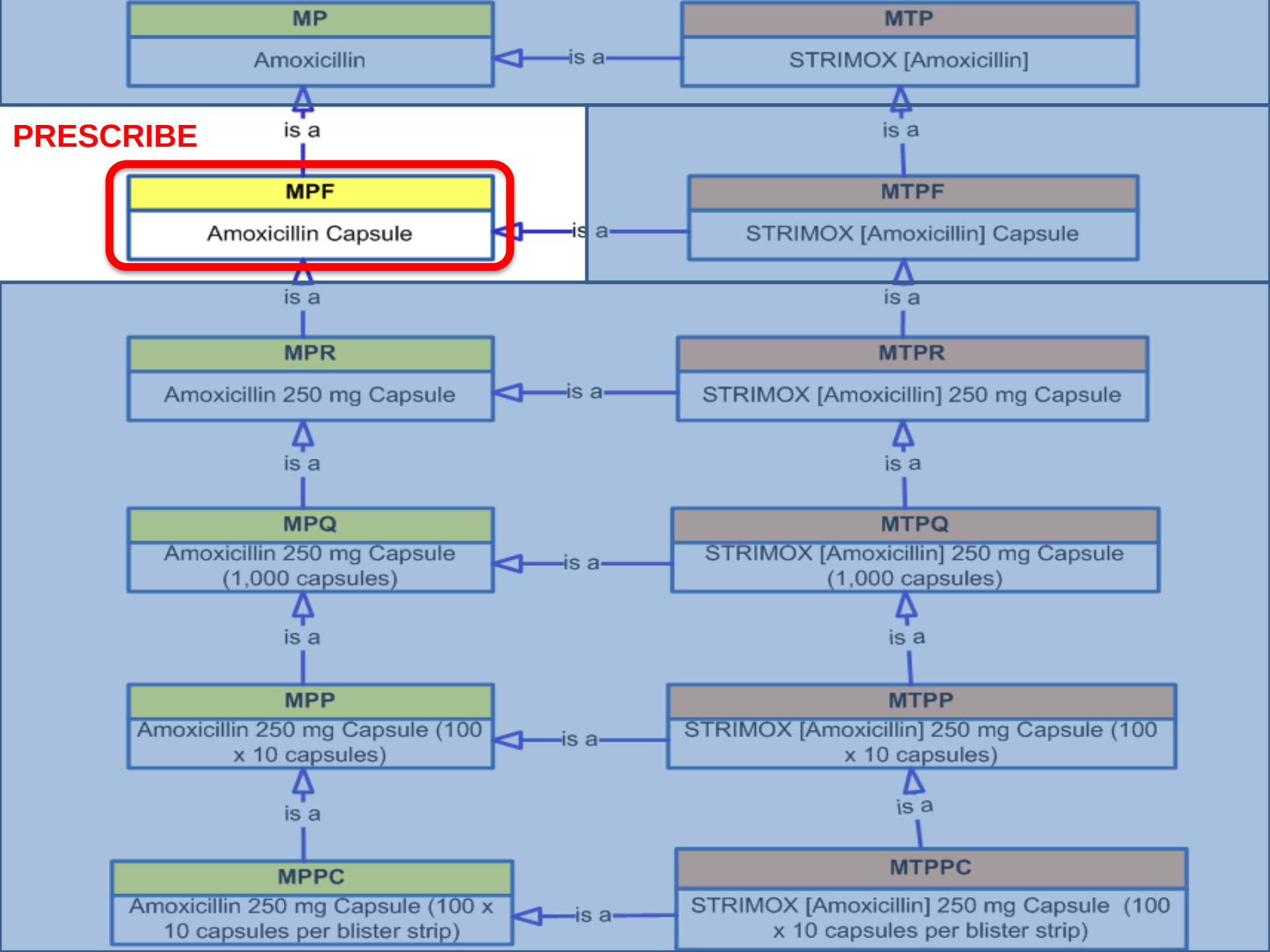
Brand

20 tablets

2 x 10 tablets

2 x 10 tablets per blister strip


Allergies DSS
Interaction checking
MP
Amoxicillin
ATC
is a
MTP
STRIMOX [Amoxicillin]
MPF
Amoxicillin Capsule
MTPF
STRIMOX [Amoxicillin] Capsule
MPR
Amoxicillin 250 mg Capsule
MTPR
STRIMOX [Amoxicillin] 250 mg Capsule
SIN Number
MPQ
Amoxicillin 250 mg Capsule (1,000 capsules)
MTPQ
STRIMOX [Amoxicillin] 250 mg Capsule (1,000 capsules)
MPP
Amoxicillin 250 mg Capsule (100 x 10 capsules)
MTPP
STRIMOX [Amoxicillin] 250 mg Capsule (100 x 10 capsules)
MPPC
Amoxicillin 250 mg Capsule (100 x 10 capsules per blister strip)
MTPPC
STRIMOX [Amoxicillin] 250 mg Capsu x 10 capsules per blister strip)
Batches & expiry
GTIN


MP
Amoxicillin
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MTP
STRIMOX [Amoxicillin]
PRESCRIBE
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Amoxicillin Capsule
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MTPF
STRIMOX [Amoxicillin] Capsule
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MPR
Amoxicillin 250 mg Capsule
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Amoxicillin 250 mg Capsule (1,000 capsules)
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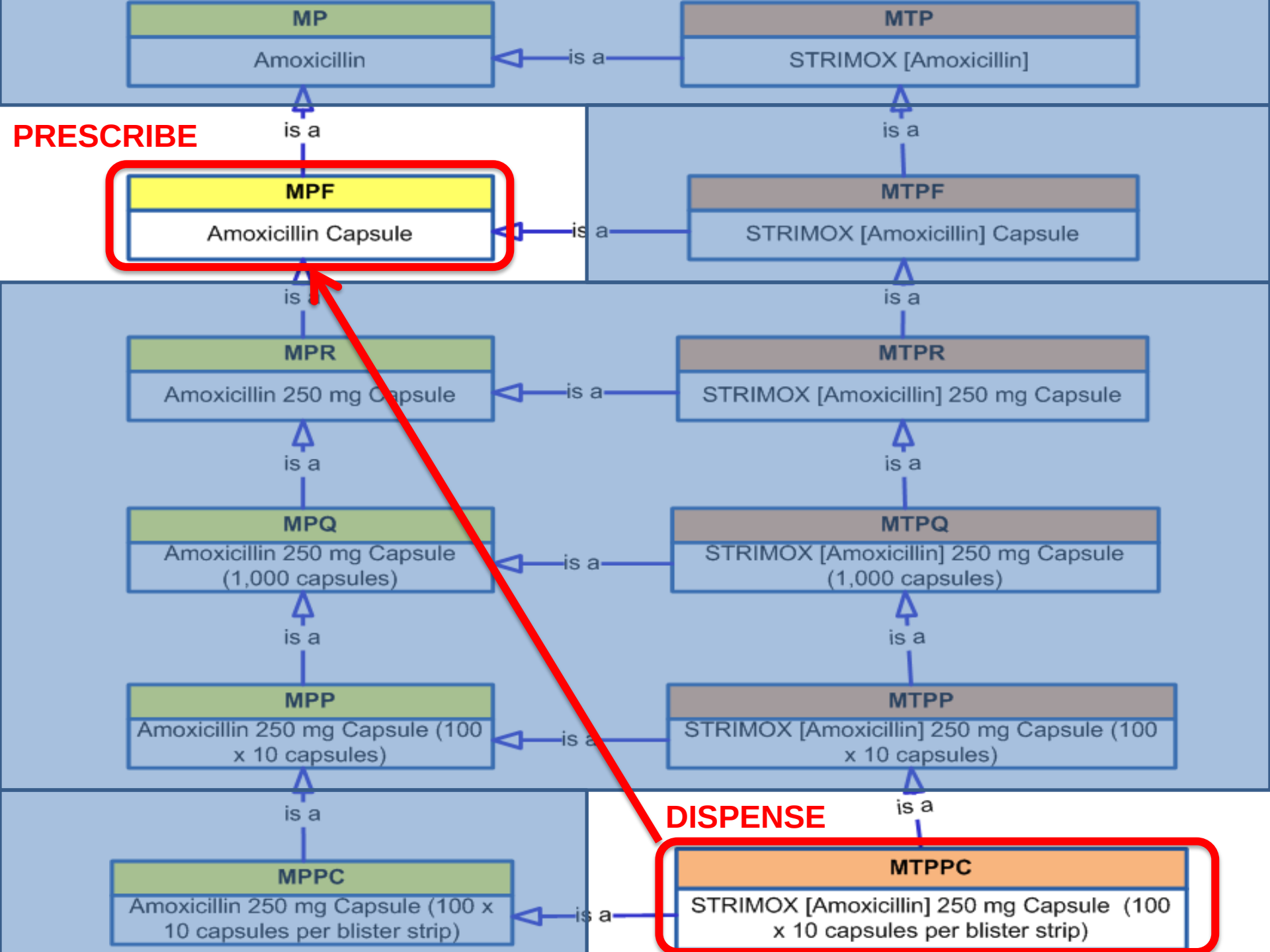
Amoxicillin 250 mg Capsule (100 x 10 capsules per blister strip)
is a
MTPPC
STRIMOX [Amoxicillin] 250 mg Capsule (100 x 10 capsules per blister strip)


MP
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PRESCRIBE
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MPF
Amoxicillin Capsule
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MTPF
STRIMOX [Amoxicillin] Capsule
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MPR
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MPQ
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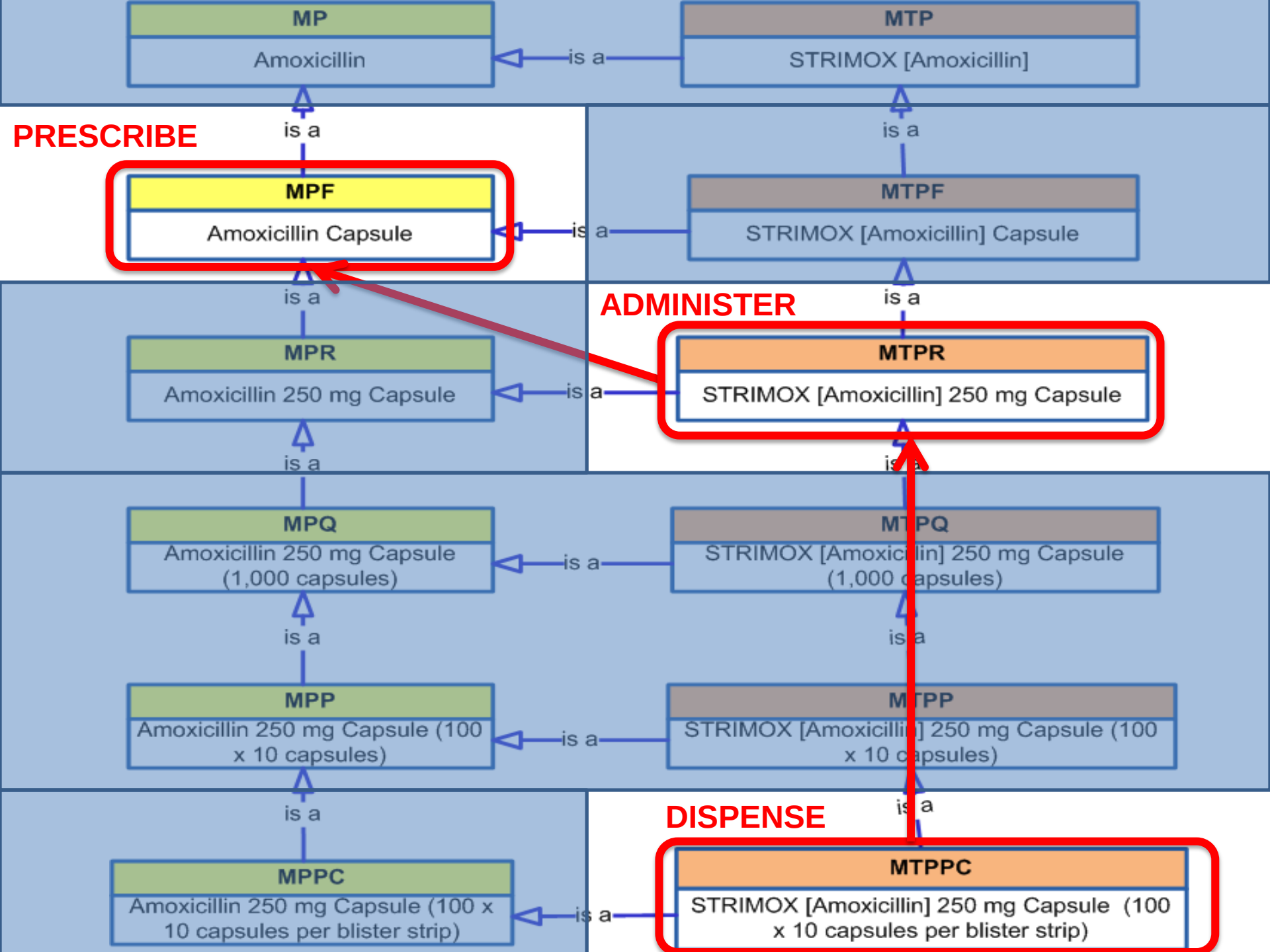
is a
MTPQ
STRIMOX [Amoxicillin] 250 mg Capsule (1,000 capsules)
is a
is a
MPP
Amoxicillin 250 mg Capsule (100 x 10 capsules)
is a
MTPP
STRIMOX [Amoxicillin] 250 mg Capsule (100 x 10 capsules)
is a
DISPENSE
is a
MPPC
Amoxicillin 250 mg Capsule (100 x 10 capsules per blister strip)
is a
MTPPC
STRIMOX [Amoxicillin] 250 mg Capsule (100 x 10 capsules per blister strip)


MP
Amoxicillin
is a
MTP
STRIMOX [Amoxicillin]
PRESCRIBE
is a
is a
MPF
Amoxicillin Capsule
is a
MTPF
STRIMOX [Amoxicillin] Capsule
is a
ADMINISTER
is a
MPR
Amoxicillin 250 mg Capsule
is a
MTPR
STRIMOX [Amoxicillin] 250 mg Capsule
is a
is a
MPQ
Amoxicillin 250 mg Capsule (1,000 capsules)
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MTPQ
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DISPENSE
MPPC
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is a
MTPPC
STRIMOX [Amoxicillin] 250 mg Capsule (100 x 10 capsules per blister strip)

The Structure of an SDD Drug

Multi Pack (e.g. 2 packs)

(Super) Pack

Subpack in Container (e.g. blister strip)

Component

Ingredient

+

Ingredient

&

Component

Ingredient

+

Ingredient

Subpack in Container (e.g. bottle)

Component

Ingredient

Tooling Demonstration

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- Create Simple Drug Definition
  - e.g. PANADOL [Paracetamol] 500 mg Tablet
    - 3 x 10 tablets per blister strip
    - 1 x 30 tablets per bottle
- Generate Drug Ontology
  - View hierarchy and open concepts to see relationships created
- Multi-ingredient, Multi-component, Multi-subpack Drugs
  - Browse the drug definitions for these and resulting hierarchies

SDD Project Timeline

MOH HOLDINGS

- 2012 February– SDD Project kick-off

- V0.7: 2012 November 3 – current release
  - Existing MOHH extension concepts and refsets imported
  - Source drug editor with revisions
  - Drug ontology generation for core medication classes
  - Drug description generation for core medication classes
  - Task management

- V1.3: 2013 June 3 - Final release
  - Drug ontology generation completed
  - Description generation completed
  - Drug ontology visualization