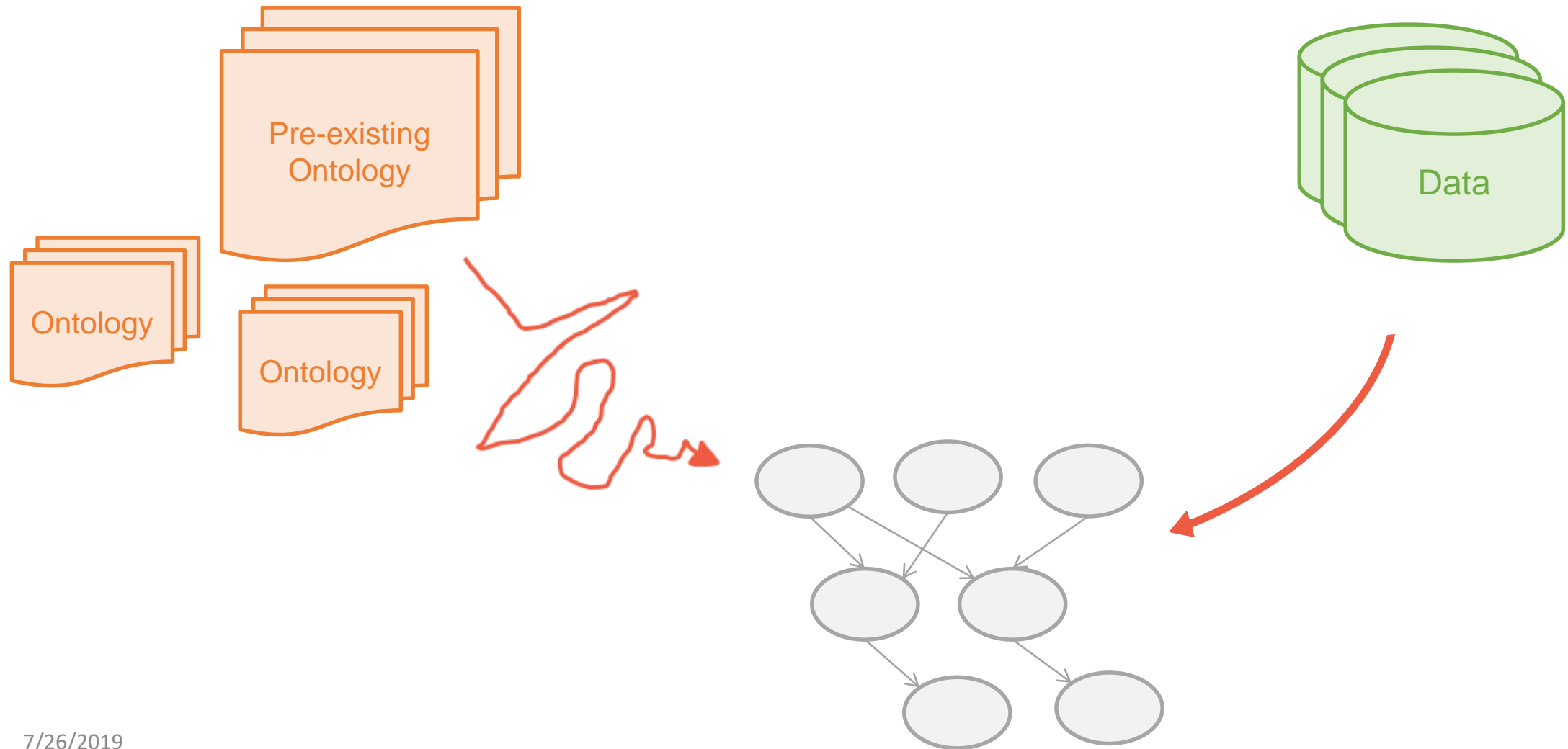


# Ontologies for Medical Decision Support

Ali Fahmi

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# Ontologies and Decision Support

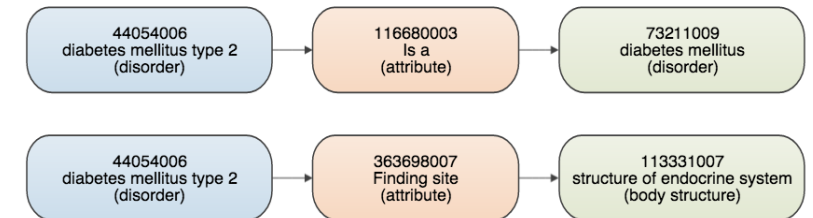


# Recent Discoveries

- SNOMEDs:
  - Snow Storm: SNOMED International's terminology server
  - Ontoserver: Australian SNOMED CT tool
  - Snow Owl MQ: Singaporean SNOMED CT tool
- KnowLife
- Technology Reference Data Update Distribution or TRUD: NHS Data Model and Dictionary Version 3
- Online Mendelian Inheritance in Man or OMIM
- MalaCards

# Snow Storm: SNOMED International's open source terminology server

- Has three types of components:
  - **Concepts:** clinical meanings organized into **hierarchies**
  - **Descriptions:** human readable terms to concepts
  - **Relationships:** link concepts to each other
    - |is a| relationships for concept **hierarchy**
    - Other relationships **other meanings** of a concept,  
e.g. |finding site|, |observable entity|, |causative agent|, etc.



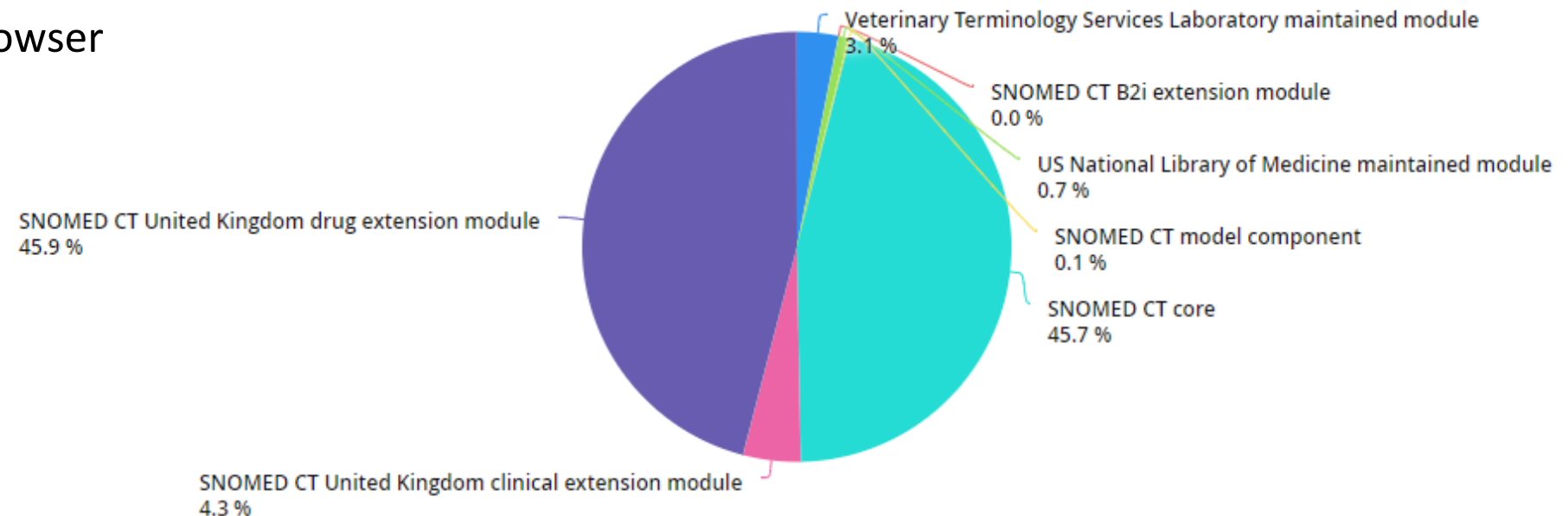
- An implementations of SNOMED CT Expression Constraint Language
  - ECL execution in API
  - Expression Constraint Queries tab in Online browser
- Free API available!

## Ontosever: Australian SNOMED CT server

- A syndicated terminology server
- Implements Expression Constraint Language (ECL)
- Based on the Fast Health Interoperability Resources (FHIR) standard
  - provides unified API to access many terminologies, e.g. SNOMED CT, LONIC, etc.
- Online browser: Shrimp

# Snow Owl MQ: Singaporean SNOMED CT server

- Implements Expression Constraint Language (ECL)
- Can be connected to UMLS
- Friendlier online browser
- Free API available!



# KnowLife

- Based on UMLS
- Automatic construction from web sources
- Covers diseases, symptoms, causes, risk factors, drugs, side effects, etc.
- Uses scientific literature
  - PubMed
- Taps into health-related social media
  - [lifesciencedb.jp/bp3d](http://lifesciencedb.jp/bp3d) for anatomic images, [clinicaltrials.gov](http://clinicaltrials.gov), [drugtalk.com](http://drugtalk.com), [patient.co.uk](http://patient.co.uk), etc.
- Provides all publications and people's conversations
- No API (as I know)!

# TRUD, MalaCards, and OMIM

## ➤ TRUD

- NHS Data Model and Dictionary Version 3
- TRUD FTP is going to be retired
- Transfer to HTTPS
- API available soon!

## ➤ OMIM

- Human genes and genetic phenotypes
- Freely available and updated daily
- API for VIP (apparently)!

## ➤ MalaCards

- Amalgamation of human diseases
- From 77 sources incl. SNOMED CT, UMLS, OMIM, etc.
- Online browser available
- No API (as I know)!