# GELLO

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## Overview

GELLO is a HL7/ANSI standard decision support language. It has its roots in OCL but has been optimised and extended for decision support. Its primary role is as a query language for obtaining clinical information from an EHR system in a standard way. It uses an abstract "virtual medical record" (vMR) so that the same GELLO code can run on multiple systems accessing data stored in different formats.

GELLO cannot alter a medical record but can perform complex logic in order to help make a decision about a patients care. Medical-Objects produced the first GELLO compiler in clinical use we are aware of; and uses GELLO for Guidelines (using GLIF or Guideline Interchange Format) and for constraints, validation and calculated fields in Archetyped data entry. It is also used to create complex data series for graphing or statistical analysis.

In our initial deployment the GELLO engine can abstract HL7 V2 data to produce a vMR. It can be integrated into any system that can provide structured data through the abstract vMR interface. It integrates seamlessly with the HL7 based Medical-Objects EHR servers and has full support for SNOMED-CT expressions using canonical forms to compare different SNOMED-CT pre and post co-ordinated concepts. It also has LOINC and ICD-10 support.

Medical-Objects' development and use of GELLO R.2 represents the cutting edge of Clinical Decision support capabilities using a standards based, cross platform, high performance GELLO engine.

GELLO continues to be supported and maintained by our R+D team.

## GELLO editor (updated April 2024)

Here is a public release of the Medical-Objects GELLO R2 editor.

A series of tutorials are below. Start with the introductory ones and work through them in turn.

1. Introduction to the GELLO editor and writing your first GELLO code!
2. Writing more code, how to bring test data into the editor
3. Using the implies method again with two longer worked examples
4. Family History example
5. Using a library and functions
6. Using GELLO online with a RESTful web service
7. Extending the model
8. Comment GELLO
9. GELLO querying a database
10. GELLO using a table done in a package
11. 'Loops' in GELLO
12. Bespoke models - do things unrelated to health in a functional way
13. Some new methods
14. GELLO and the FHIR4 based International Patient Summary

## GELLO SDK (2012) - out of date

The Gello SDK allows developers to create plugins for the Medical-Objects Gello engine and IDE, for creation of concrete VMRs that can be used for clinical decision support with Gello.

**Gello SDK may be downloaded from the Gello SDK Version history page**

Tutorials are here:

**Introduction**

**Installation**

**IDE Overview and writing First Gello program**

**Gello Plugin Manager**

**Overview presentation**

## GELLO VA VMR (2011) - historical overview

An experimental build of the Medical-Objects GELLO IDE interfaced with VA MDWS servers and produced collated XML data from VistA instances.  For further details and activity of that completed project visit **https://sites.google.com/site/enhancedcprscds/gello-vmr-knowledge-base**

The integrated Gello IDE environment allowed selection of a single patient and allowed for the execution of Gello programs against a patient context to draw conclusions based on  health record information. Gello execution ran against an object model which represents the medical record using classes which are composed of ISO 21090 datatypes.

A experimental not for production use release was made for the Clinical Decision Support technical committee at the HL7 Working Group meeting September 2011. This is an experimental interim build and is not tested for production use.

The installation included a number of examples which demonstrated how Gello could be used in the context of a VMR.

The deliverables presentation for VA Innovation Project #209 is available **here**:

# GELLO R2 User Guide

An updated user guide for GELLO R2 is available **here.**

**A user manual is also under development here**

# GELLO ISO 21090 Datatype Guide

**ISO 21090 Datatypes Guide**

# GELLO for HL7V3 Pedigree Model

An experimental build of the GELLO authoring tool that can load the full Pedigree RMIM instance data and execute GELLO against the instance has been released for the Sydney HL7 Working Group meeting. The pedigree model has been incorporated in the Medical Objects V2 VMR.

# GELLO Download (2009)

The GELLO Authoring Tool for GELLO V1 R2 (previously known as GELLO 1.1) is no longer available.

# GELLO Class file Syntax (in Extended BNF)

We are using an extension to GELLO as a means of interchanging models for use in GELLO using a simple human readable format called GELLO Class Files or GELLO Model Files.

Files with the extension ".gello_model" conform to the BNF grammar found at **GELLO Class file BNF**

This syntax has been designed to be as generic as possible to represent as wide a range of models imported from many sources. As such we have tried to minimize the number of reserved words by assuming that core OCL data types like "Integer", "Real", "Boolean", "String", "Set", "Bag", and "Sequence" are represented by the generic <ID> token. Likewise, we have defined the grammar such that compound classes like "Set(SomeClass)" are defined using a Generic class syntax. This syntax goes beyond the basic collection classes and can represent more generalized compound classes comprised of one or more component classes.

Also in order to accommodate Package, Class, Attribute and Operation names imported from languages or sub-systems which clash with GELLO or OCL identifier syntax, we also allow a string literal to be used in place of a name where appropriate.

# Previous Announcements

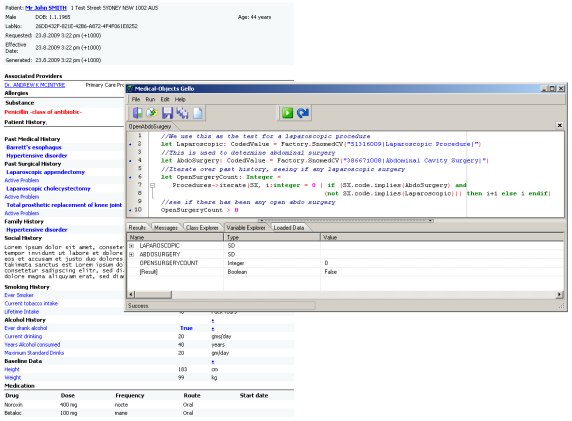
GELLO Authoring Tool Released - Tuesday, October 14, 2008 - Tuesday, October 14, 2008 Medical-Objects is pleased to announce the first release of their GELLO Authoring Tool for Windows(r) platforms. This tool implements the proposed GELLO 1.1 BNF update and includes some advanced features. read more ...

GELLO Compiler Available - Tuesday, August 21, 2007 - Tuesday, October 14, 2008 Medical-Objects today released demo versions of our GELLO compiler and an interim Version of a GLIF editor. The GELLO compiler supports our new grammar. There are many GELLO examples included, both as standalone files and integrated into a GLIF Lymphoma Wizard. The GLIF wizard is the result of a research project which was partially funded by The Australian Governments ITOL (Information Technology Online) Program. Included in the download is quite extensive documentation on GELLO, GLIF and archetypes in HL7 V2.

Please **contact us** if you would like a copy of the application.

# Example of Use

This screen shot gives an example of the sort of task that GELLO is very good at doing. The question to be answered in this case is "Has this patient had any open abdominal procedures" This question may be relevant to a planned activity, such as a booking for a capsule endoscopy. Using a GELLO snippet and the vMR (Virtual Medical Record) along with a SNOMED-CT encoded medical history this question can be answered by executing a snippet of GELLO. This needs to be integrated into a higher level decision support strategy, but does the heavy lifting to answer a question that has previously been hard to automate. Its this type of use that makes us excited about the potential for GELLO! This screenshot comes from the Medical-Objects explorer product.




# GELLO User guide and slides

**Gello_User_guide.pdf** Takes you through GELLO, datatype by datatype with examples (Note this is now deprecated GELLO V1)

**GELLO_-_Real_World_Implementation.pdf** Some slides from 2007

# Family History GELLO examples (2015)

The vMR contains Family History data based on the HL7 v.3 pedigree model outlined above. Here are some example gello files making use of this. Sample data is included. A later version of the GELLO editor is required.

**ProstateCancer_Gello.zip**

**BowelCancer_Gello.zip**

**BreastCancer_Gello.zip**