ISIT315

Assignment 4 Report

Anime & Manga Ontology

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# Group members

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| --- | --- |
| Daniel Barnes | 5053511 |
| Hoang Duong Nguyen | 5177832 |
| Jingwang Teh | 5238699 |
| Minh Tan Le | 5142179 |

# Methodological Approach on Developing Ontology

The domain that we have chosen is on the Anime & Manga Industry, based on data from myanimelist.net, which is the most popular database site for all Anime & Manga entries.

# Planning

## Purpose

The purpose of building a Media Ontology is to provide a knowledge model of the Anime & Manga series that can be used by similar users of that site for searching relevant media, which can then be expanded to include data from other similar sites with information on other mediums (e.g. Visual Novels, Games, Blu-ray Drama, and etc) to produce a more complete relation of the series.

## Scope

The ontology will only focus on the anime & manga domain. The level of detail will be based on the entries described in myanimelist.net.

## Implementation Language

The ontology is to be implemented using protégé in OWL language, Manchester syntax.

## Intended Users

* This ontology is intended for people who are interested in the Anime & Manga industry.
* It is also for people who would like to find out more about a particular series.
* It is also useful for users who want to find the source material of a certain media adaptation in order to support the original author.

## Intended Uses

* The user can find out the studio, staff, character, age rating, genre, age rating and current status of the particular series.
* This ontology should allow users to look for all series of a particular season.
* The user should be able to find out the score rating of a particular series.
* Users can also find the source material that the series adapted from.
* Users can find the prequel and sequels of the series.

# Requirement Specification

## Ontology Requirements

### Functional Requirements

The ontology includes the following entities:

* MediaType
  + Anime
    - Movie
    - OVA
    - Special
    - TV
  + Comic
    - Doujinshi
    - Manga
    - Manhua
    - Manhwa
    - Novel
    - One-shot
* Character
  + MainCharacter
  + SupportingCharacter
* Staff
  + AnimationDirector
  + Director
  + EpisodeDirector
  + Producer
  + SoundDirector
  + VoiceActor
* Studio
* Magazine
* Author
* Genre
* Status
  + AnimeStatus
  + ComicStatus
* AgeRating
* Season (from Winter2010 to Fall2018)
* Series
* SeriesScore
  + Appalling
  + Average
  + Bad
  + Fine
  + Good
  + Great
  + Horrible
  + Masterpiece
  + VeryBad
  + VeryGood
* SourceType

There are also object properties, such as:

* characterIn
  + mainCharacterIn
  + supportingCharacterIn
* hasCharacter
  + hasMainCharacter
  + hasSupportingCharacter
* isVoicedBy
* voicesCharacter
  + voicesMainCharacter
  + voicesSupportingCharacter
* hasStaff
* isStaffOf
* hasPublisher
  + hasSerializaiton
  + hasStudio
* publisherOf
  + serializationOf
  + studioOf
* hasAuthor
* isAuthorOf
* hasGenre
* isGenreOf
* hasStatus
* isStatusOf
* hasAgeRating
* isAgeRatingOf
* hasPrequel
* hasSequel
* hasSourceType
* isSourceTypeOf
* isAdaptionOf
* isPartOfSeries

Data properties includes:

* hasSynonymTitle
* hasSynopsis
* hasStartDate
* hasEndDate
* hasScore
* hasTotalEpisode
* hasDuration
* hasBirthday
* hasDescription

### Non-Functional Requirements

1. The ontology should use real data.
2. The synonym title data property should be in romanized format, and not in katakana, hiragana, or kanji format.
3. The seasons should be Japan’s seasons.
4. Class, instance, object and properties titles should be easy and straightforward to understand.
5. Each of the animes and comics must have its start-airing date, while the finish-airing date is optional.
6. Classes about media should be populated with at least one instance.
7. There should be enough (50-100) number of classes and properties.
8. The ontology should be constructed logically so that it will be easy to maintain later on.
9. Classes and subclasses should be organised rationally.
10. The structure of the ontology should support expansion at a later date.

# Conceptualization

## Determine scope

We decided to do our ontology about anime and manga domain. The ontology will be used to store information and relations of anime and manga series, which is a large amount of information. The ontology will provides details relating to these media ranging from name to character of those.

## Consider reuse

Since the assignment requires us to develop a new ontology, we built our ontology from scratch and no ontology was reused.

## Enumerate terms

As our ontology covers anime and manga domain, relevant terms that can be expected in our ontology will be all the characteristics of an anime/manga, such as:

* Name
* Release Date
* Author
* Genre
* Type (Manga - animation or Comic)
* Season
* AgeRating
* etc.

And we finalise the terms to deliver the classes and properties as such in our ontology.

## Define taxonomy

We used the top-down method of defining taxonomy in order to populate our ontology with classes and subclasses. For example, we started with the definition that series have their scores/ratings, and then expanded it into more detailed subclasses of scores/ratings ranging from Horrible to Masterpiece.

## Define properties

Properties were also defined during the insertion of new classes to make sure all the properties of each class is covered.

## Define facets

Based on the properties of the class, we have also identified proper facets for classes such as each subclass of class season has certain minimum and maximum cardinality. We can then later on use that to infer which season does an anime series belongs to.

## Define instances

Instances were defined based on real data we collected from myanimelist.com database. We start from class anime, find an instance, and then fill in its properties and values.

## Check for anomalies

Overall, the ontology is consistent with the initial ideas about the anime/manga domain.

# Evaluation

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Question** | **Answer** | **Correct?** |
| 1. | Anime\_Joker\_Game have a score of 7.16, does it have a good (score of 7 inclusive to 8 exclusive) score? | “Good” Score | Yes |
| 2. | Anime\_Joker\_Game has a start date of 2016 April 05, which is Spring of 2016 (according to Japan’s season) | “Spring 2016” Season | Yes |
|  |  | | |
| 3. | Is Character\_Miyoshi a character in Anime\_Joker\_Game? | Character\_Miyoshi is characterIn Anime\_Joker\_Game | Yes |
| 4. | Does Staff\_Hiro\_Shimono voice this character? | Character\_Miyoshi is voicedBy Staff\_Hiro\_Shimono | Yes |
|  |  | | |
| 5. | is Staff\_Kazuya\_Nomura a staff for the Anime\_Joker\_Game? | Staff\_Kazuya\_Nomura is a staff of Anime\_Joker\_Game | Yes |
|  |  | | |
| 6. | is Studio\_Production\_I.G the studio that had published Anime\_Joker\_Game? | Studio\_Production\_I is the studio of and publisher of Anime\_Joker\_Game | Yes |
|  |  | | |
| 7. | has Anime\_Joker\_Game finished Airing? | Yes, Anime\_Joker\_Game should have a status of Status\_Finished\_Airing, as well as other series | Yes |
|  |  | | |
| 8. | Is Anime\_Joker\_Game part of the Genre\_Historical? | Genre\_Historical is the genre of Anime\_Joker\_Game, as well as other series. | Yes |
|  |  | | |
| 9. | Is Anime\_Joker\_Game of the age rating of R17+? | Age\_Rating\_R17+ is the age rating of Anime\_Joker\_Game, as well as other series | Yes |
|  |  | | |
| 10. | Is Author\_Yuusuke\_Murata the author of the Comic\_One\_Punch\_Man? | Yes, Author\_Yuusuke\_Murata is the author of Comic\_One\_Punch\_Man | Yes |
|  |  | | |

# Discussion of Issues/Problems

**Issue:** Not all series have its entries to fully satisfy the non-functional requirement

**Solution (if possible):** Extending the ontology to cover more database resource sites.

**Issue:** Large ontology may creates overlapping classes/subclasses, especially when inferred.

**Solution (if possible):** May rename classes to avoid overlapping, or change relations between those classes.

**Issue:** Various classes may cause conflicts when inferencing

**Solution (if possible):** Go through each class carefully when inserting as well as check inferenced result to make sure the ontology is working as desired.

**Issue:** Protégé is not a platform that supports collaboration for a group to work on the same ontology. This is a bit annoying when everyone wants to contribute to the ontology but don’t want to overwrite others work.

**Solution (if possible):** We uploaded the file on GitHub, which makes collaboration so much easier than uploading the file every time someone makes new updates.

**Issue:** Large ontology require heavy computational capabilities. We cannot run the final version on our own machines.

**Solution (if possible):** Members of our group takes turn run the ontology on machines provided at the lab.

# Contribution

|  |  |  |
| --- | --- | --- |
| **Member** | **Contribution** | **Evaluation** |
| Daniel Barnes | * Subclasses expansion * Individuals/Instances gathering * Presentation documentation | Fully contributed |
| Hoang Duong Nguyen | * Subclasses expansion * Individuals/Instances gathering * Non-functional requirements * Conceptualisation * Discussion of Issues | Fully contributed |
| Jingwang Teh | * Domain contribution * Initial ontology structure * Scope * Functional requirements * Further class expansion * Inference evaluation | Fully contributed |
| Minh Tan Le | * Subclasses expansion * Individuals/Instances gathering * Non-functional/functional requirements * Conceptualisation * Discussion of Issues | Fully contributed |

# Reflective Learning

## Reflective Learning from Jingwang Teh

From the ontology that was created, I understood the need to efficiently plan the structure of the ontology and its relations so that there are fewer unnecessary details that would have otherwise lead to an overly complex ontology that can be slow to process.

I have also learnt to structurally expand the ontology in terms of functionality and complexity in order to accommodate an expanded scope.

Besides that, it is also important to communicate well with the team, which lets us establish a standardized method of implementation, such as a standardized naming convention.

Lastly, I have understood the different methods that parts of the ontology can be implemented, and it is important to have a bigger perspective even when looking at the details of the ontology.

## Reflective Learning from Duong Nguyen

Throughout the duration of the assignment, I have learned so many things that were useful. We did an ontology about anime based on the anime database. I have improved my understanding about OWL and got a good chance to practice writing the ontology with my group. The ontology itself is also large and it was a good challenge to gather and handle all the information for the ontology.

Developing ontology also helps me understand the relations and properties of a certain area of information, which in our case is the anime database. This also helps me to have a logical and structural overview of the information. Moreover, working on this assignment also gives me a chance to collaborate with other group member and improve my teamwork skills. Overall, the assignment is a very beneficial experience.

## Reflective Learning from Le Minh Tan

The first thing that I have discovered in this assignment was the advantage of working as a part of a group. I have been enlightened that good teamwork is the only key to success. And with every member has their own ideas for the assignment, I have learnt how to express mine and how to work collaboratively with the team.

Besides, I have also realised that a proper planning could be extremely beneficial when the time is limited. A good plan will definitely offset future changes, help increase the complexity of the ontology we are building, and provide an efficient and effective control of the whole process.

And most importantly, the assignment has offered us a great opportunity to learn to build an entire ontology from scratch. I have also discovered that working on a topic you are interested in could turn your assignment into tons of joys. For us, that topic is anime and manga. And I have indeed found a lot of fun just by creating the classes and properties, and adding the instances to demonstrate the use of our ontology.

## Reflective Learning from Daniel Barnes

As the ontology was based on anime and manga, a subject which I was not too familiar with before, designing and implementing an ontology based on it greatly increased my knowledge of the domain.

Through completing this assessment, I gained first-hand experience designing and implementing a larger scale ontology. I now have a greater understanding of implementing defined classes and its importance for inferencing purposes. I also have a better understanding of how inferencing works and how/when to use it. Using protege to implement the ontology, I improved my proficiency with protege.

The assignment gave me experience in using a methodological approach to build an ontology from scratch, in addition to having to make design decisions such as what entities are classes, properties or individuals.

Having to test the ontology for errors/inconsistencies, I learnt how to evaluate an ontology to determine its correctness.

After completing the assignment, I realise the importance of having a plan before you begin implementation. This can save a lot of time and confusion, especially if you have to redo poorly designed elements of the project. It is also extremely important to maintain open and frequent communication between team members, as the quality of the project can reflect any problems between team members. Communication is also important to avoid any confusion/misunderstanding and to keep the project on schedule.