Proposal and Validation of the Data Model of Video Game Database

FUKUDA, Kazufumi (Ritsumeikan University)
INOUE, Akito (Ritsumeikan University)
HOSOI, Koichi (Ritsumeikan University)

Replaying Japan 2016 @Leipzig University (Aug 16, 2016)
Introduction

• In recent years, research interest in the game as intellectual resources show an increasing trend.
• Games began to have a meaning as research materials.
• Accordingly, Discussion of the game preservation has been activated (Winget & Murray 2008, Lowood et al. 2009, Newman 2012).
Introduction

• On the other hand, it can be said that the construction of game databases or archives is lagging behind.
• A major reason for this is that we lack feasible database models capable of catering to the needs of game cultures and contents, and their distribution.
Introduction

• Purpose of this study
  1. To discuss about the data model through previous models and studies.
  2. To propose a data model for describing “game (bibliographic) universe”.
     • “From 1992-1995 the IFLA Study Group on Functional Requirements for Bibliographic Records (FRBR) developed an entity-relationship model as a generalized view of the bibliographic universe, ...” (Tillett 2004, p. 2)
  3. This data model is to construct a database implementing linked data (Heath & Bizer 2011).
  4. Database is to improve the accessibility of the actual product. By this, it will be contribute for game studies and researches.
     • The basis of content analysis and comparative studies
FRBR

- FRBR (Functional Requirements for Bibliographic Records)
  - FRBR indicates Final Report of International Federation of Library Associations and Institutions (IFLA 1998)
  - Moreover, it is popular conceptual model in the report (Tillett 2004)
  - Almost librarians and researchers (library information science) are thinking that “This can not be ignored at discussion of catalogs”.
  - FRBR makes basics of data model for various types of catalogs.
    - ex) FRAD (Functional Requirements for Authority Data), FRSAD (Functional Requirements for Subject Authority Data), FRBRoo (FRBR-object oriented), BIBFRAME
**FRBR**

- **Example**

  - **w¹** Haruki Murakami’s *Norwegian Wood*
    - **e¹** the author’s text edited for publication
      - **m¹** the hardcover book vol. 1 issued in 1987 by Kodansha
        - **i¹** an actual book in National Diet Library
        - **i¹** an actual book in my bookshelf (cover is broken)
      - **m²** the hardcover book vol. 2 issued in 1987 by Kodansha
    - **e²** Translated text by Jay Rubin edited for publication
      - **m¹** the book vol. 1 issued in 2000 by Vintage Books
        - **i¹** the actual book in National Diet Library
      - **m²** the book vol. 2 issued in 2000 by Vintage Books

Figure. Group 1 of FRBR
Figure. Group 2 of FRBR
BIBFRAME

• BIBFRAME is a data model for bibliographic description
  • Bibliographic framework for Linked data
• This model proposed by the Library of Congress (Library of Congress, 2012).
• It was designed to replace the MARC Standards.

Figure. BIBFRAME 2.0 Model, April 2016
(Library of Congress. Overview of the BIBFRAME 2.0 Model. available from https://www.loc.gov/bibframe/docs/bibframe2-model.html)
Previous Studies: Data model for Videogame

• Fukuda & Kamata. (2015)
  • “Research on Game Preservation Studies and Reference Network Analysis”. Replaying Japan 2015, Ritsumeikan University, May 21, 2015.

• McDonough et al. (2011, 2012)
  • Trying to Apply FRBR and other data models

• Lee et al. (2013)
  • Design core set of metadata

• Jett et al. (2016)
  • Describing a conceptual model
Previous Studies: Data model for Videogame

- McDonough et al. (2011, 2012)
  - Activity of “Preserving Virtual Worlds Project”
  - They are investigating FRBR’s potential as a model for the description of computer games and interactive fiction.
  - They were examined cases of 7 titles.
    - “Spacewar!”, “ADVENTURE”, “Star Raiders”, “Mystery House”, “Mindwheel”, “Doom” and “Secondlife”
  - In particular, application of the PC game was difficult.
  - It is not easily determined how to distinguish and precisely characterize group 1 (work, expression, manifestation & item).
  - FRBR cannot be used for the description of game universe simply.
Previous Studies: Data model for Videogame

• Lee et al. (2013)
  • Design metadata schema for the Seattle Interactive Media Museum
  • Metadata-set named “CORE16”
    • Title, Edition, Platform, Format, Developer, Publisher, Retail release date, Number of players, Online capabilities, special hardware, Genre, Series/franchise, Region, Rating, Language, UPC
  • Evaluation of items (property) for various stakeholders.
    • Stakeholders are Player, Parent, Collector, Academic, Designer & Curator in this paper.
Previous Studies: Data model for Videogame

• Jett et al. (2016)
  • “A Conceptual Model for Video Games and Interactive Media”
  • They propose a conceptual model for videogames and interactive media.
  • Major relation (hierarchy) is Game, Edition, Local Release and Distribution Package.
Figure. Data model (Jett et al. 2016)
Previous Studies: Data model for Videogame

• They take a similar view.
• There are few objections which can be raised against this.
  • Should we call “game” for top entities of major hierarchy (likely group 1 of FRBR)?
    • For example, gamers (or people who are touching games on a daily basis) don’t dare to call “game” the entity.
  • Is “Edition” higher than “Local release”?
    • As will be discussed in the context of localization or cultural translation, “Local release” is edited as well as the “edition”.

Proposal model

• This model is designed for expanding media-arts DB.
  • https://mediaarts-db.jp/gm/
  • This database is achievement of project of Agency of Cultural Affair. We are in charge of designing and input.

• Media-arts DB is composed of a list of packages. Because, this data model has been designed from Package.

• Game is not the only commercial product but also cultural resource. Furthermore, The structure has been complicated by the change of the environment of information technology. This model designed to describe the complex nature/structure of “Game” precisely.
Figure. Proposal model of Our Research
Work, Package, Item

• Major relationship of this model
• These are likely FRBR (without Expression) and BIBFRAME
  • PackageDB is for package or product of the game. It includes with digital package and physical package. Package list was constructed at media-arts DB.
  • Work is an abstract entity that is group of the same title of packages. Packages in one work record are given approximately the same game experiences. Work was made with text compressor with package title.
  • Item is an actual product of a package. ItemDB is made with catalogs of any archiving agents.
Case: Work, Package and Item

• **Work**¹ Dragon Quest III
  • **Package**¹ Dragon Quest III Soshite Densetsu e... (FC)
    • **Item**¹ An item of this package is owned by Library of Leipzeg University
    • **Item**² An item of this package is owned by RCGS (Ritsumeikan Center for Game Studies)
  • **Package**² Dragon Quest III Soshite Densetsu e... (SFC)
    • **Item**¹ An item of this package is owned by RCGS (Ritsumeikan Center for Game Studies)
  • **Package**³ Gameboy Dragon Quest III Soshite Densetsu e...(GB)
    • **Item**¹ An item of this package is owned by National Diet Library, Japan.
  • **Package**⁴ Dragon Quest III Soshite Densetsu e...(i-mode)
  • **Package**⁵ Dragon Quest III Soshite Densetsu e...(ezweb)
  • **Package**⁶ Dragon Quest III Soshite Densetsu e...(iOS)
  • **Package**⁷ Dragon Quest III Soshite Densetsu e...(Android)
Figure. Proposal model of Our Research
Agent (Person & Organization)

• Agent is likely Group 2 of FRBR.
  • Agent means a Person or Organization (Corporate Body).
    • Person is not staff in this model. It’s only responsible agents written clearly in items.
  • Agent has relation with Package and Item.

Figure. Related entity with Agent
Figure. Proposal model of Our Research
Platform

• Platform is a characteristic entity of game.
  • Hardware is often the same as platform (Typically classical console game).
  • However, software, online or business platform aren’t so.
    • Ex) Windows, Steam, Game Archives
  • In recent year, their relationship is progressing complication. Therefore, We think they should be described.
Other Entities

• Source
  • Resource of entity (It’s “Package” in this model) from which value or label came or was derived.

• Series/Universe
  • These are good to connect with other popular culture’s databases. Particularly, they are Manga and Animation databases at media-arts DB.
    • Ex) Series¹ Dragon Quest, Series¹ SimCity, Universe¹ Dragon Ball, Universe¹ Pac-Man
Subject of Validation

• We are promoting to construct database with Filemaker.
• It does not implement all of the entity as a database. High-priority entities have been implemented in this database.
  • Peripheral equipment, Brand & Staff ...
• However, We cannot describe non-actual products enough. Online game and downloaded game (digital package) have various other subjects to verify with this model.
  • Version (it’s numerous at popular titles), MODs, nothing of the item (actual product) and more
Conclusion & Future works

• We think that this model can describe the game universe related to actual product mainly. We are promoting an implementation/construction of database to publish database with this model next year.

• This model’s target is physical packages mainly. We have to design additional entities in the future.

• Database constructed with linked data and RDF is having extensibility. Please let me know if there is a simpler or better way for proposal model in this study.
References