# 15,000 video games in the library
# Challenges in the dissemination of interactive digital objects

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## ABSTRACT

This poster describes current processes and challenges for the preservation and dissemination of video games from the heritage collections of the National Library of France (BnF).

## 1 INTRODUCTION

The National Library of France holds over 15000 video games in its Audiovisual collections.

The mandate to collect, preserve and give access to these games is part of its larger mission to manage the legal deposit of multimedia documents. As defined in the 1992 law that extended the scope of legal deposit in France, multimedia documents are those which include two or more types of document on the same physical media. This definition, however imprecise, has allowed the library latitude to gather all sorts of artifacts of the evolution of interactive publications. Several video games publishers voluntarily sent their products to the BnF from the early 1990s onwards. A more targeted effort has been made since the turn of the century to check the coverage of legal deposit, paralleling the global trend of reevaluating video games as works of art. The legal deposit collections have also been augmented with donations and acquisitions, in order to get coverage of the 1970s and 1980s, and to offer a choice of foreign games to researchers, who may have more difficulty accessing Japanese editions for instance.

It has always been the intention of the library to collect video game content distributed via app stores, console stores and online game stores, but the proportion of downloadable content in the BnF's holdings is still low, due to the lack of preservation solutions for these digital objects, whose distribution channels are laden with DRMs.

The way the collection has been built at the National Library of France has several consequences for the solutions for preservation and access currently in place, and the opportunities to better its practices.

The multimedia collections are not sorted by content type but by media type. There are separate call numbers for floppy discs, optical discs and cartridges, and they are stored separately. The cartridges can arguably be equated with video game content; however the other call numbers contain a mix of video games and other content.

Bibliographic records have not always been created with precise data regarding the nature of the content type and the operating system for a given document. Retrospective cataloging is currently in place.

The BnF does not have the means to maintain in the long term the set of original machines it has acquired to match the various platforms for which the games were published. As the library cannot depend on them for access, it turned to emulation early on, when technologically possible.

There is a strong and growing interest of the research and amateur communities in video games, their history, their sociological impact, their artistic merits. Therefore there is increased pressure on the library to be able to identify the games and have data on which parts of the collection can be accessed, either on the premises of the research library or when presenting selections from the heritage collection at events. This poster will present the processes involved in making a large scale video game collection accessible, and the challenges the BnF is currently trying to meet to improve its services.

## 2 THE COPYING PROCESS

The first analysis concerns the systematic copying process from physical media, to preserve content and prepare for a wide range of access requests in the reading room.

The number of games in the multimedia collections is an estimation, based on the experience of curators and extant bibliographical records:

- 1,500 on floppy discs (Amiga, Atari...)
- 3,000 on cartridges (several generations of Nintendo and Sega gaming consoles, PlayStation Portable and HuCards for PC Engines) and figurines carrying playable content (Skylanders series, etc.)
- 10,500 on optical discs (PC games, Playstations 1 to 4, etc.)

The progress of the copying program depends on:

- availability of hardware and software specific to a platform;
- availability of specific skill sets from library personnel, interns or contractors.

So far, the success rates of the copying process, as reported by the copying software, reaches:

- around 98% of optical discs, out of a total of 31,000 discs copied, with a higher rate of failure on proprietary game content; however, discs from certain proprietary platforms are currently excluded from the campaign since it uses standard PC hardware and robotics (Wii, XBox, Playstation 3, PlayStation 4; around 7% of the collection total);
- around 90% of the games on cartridges, out of 1,301 documents (Sega Master System, Super Nintendo, Nintendo 64 and Nintendo DS);
- about 50% of the games on floppies, out of 4,956 floppies copied, representing 1 385 documents (Atari ST, Amiga, Amstrad CPC and Commodore 64).

There are no systematic tests to make sure the copies are actually readable. When tests have been done, the results are encouraging. Out of 373 Mega Drive games for instance, copied and tested in the summer of 2016, 326 were accessible in an emulator, 27 could not be copied, and 3 were copied but would not run in the test emulator.

# 3 THE EMULATION PROCESS

From the experience gained from making specific selections available for a thematic event, a qualitative analysis of the emulation and delivery process is possible. The BnF has, over the past year, made available a number of games from its heritage collections through emulation for events, both within the library and at the largest French video game convention, the Paris Games Week.

The first step is content selection. An ideal list based on knowledge of the merits and cultural impact of games is cut down by checking it against actual library holdings. Certain titles are unavailable due to lacks in legal deposit or acquisitions, document loss or theft, etc.

The second step is copying the games, when this hasn't already been done through systematic campaigns or when the copy failed. Some games have been published on multiple platforms, and different editions may be tested, when copying and emulation software is available. When the physical media and the gaming consoles are in good working condition, original access set-ups may be used, but it is not the library's policy: emulation is the preferred preservation strategy.

The third step is testing the copies using a selection of available emulators. There usually is one prominent emulator able to run most games on each platform; for some games however, it may be useful to test two or more. The emulators' performance may be hampered by various computer and network safety requirements. Some glitches require extensive testing to be spotted and may only appear at a later phase of the process or when the game is played by the end user. Some games run well in the emulators but still make for a poor gaming experience and thus are removed from the selection: when the emulator runs slowly, or when a contemporary keyboard or gamepad cannot replicate the original interaction, for instance.

The fourth step is setting up the emulators to run with the available selection of PCs and controllers. This is a time consuming process as every action of every game needs to be assigned to a button or key and tested.

Event 1: Open Days at the BnF, November 2015
- 4 PC games were selected,
- 3 PC games were satisfyingly copied
- 1 alternative edition on Nintendo 64 was selected.

Event 2: a presentation of historic heroic fantasy games at the BnF, matching a promotional event by Blizzard Entertainment on one of the library's towers, August 2016[1]
- 14 games were selected, representing 19 different copies (3 were available on two or more platforms)
- 10 games were presented, 1 running on the Hatari emulator, 5 on the DOSBox emulator and 4 on WMWare

Event 3: the BnF's stand at the Paris Games Week, October 2017
- 20 games were selected, representing 25 different copies
- 13 games were presented: 1 Amiga, 4 1990s PC, 1 Sega Master System, 3 Sega Saturn, 1 Nintendo 64, 1 PlayStation and 1 Playstation 2

Reasons for excluding games are varied, for instance:
- 4 Atari ST games were selected but were not accessible: 3 were on degraded floppies and content could not be read;
- 1 required a change between two floppies, which the emulator can simulate between two disc images, but it was deemed too complicated outside of a reading room context;
- moreover, the Atari emulator was deemed not ergonomic enough for an event aimed at the general public.
- 1 Amiga game required a keycode input to run; it was not judicious to add an extra step to the access process in the context of a gaming show.

The BnF wishes to improve the information it provides to users and potential users about what can be accessed and in what timeframe. The library intends to continue gathering data about the preservation and dissemination processes to allow it to improve them over time.

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[1] https://worldofwarcraft.com/fr-fr/news/20243515/illidan-s-installe-a-paris