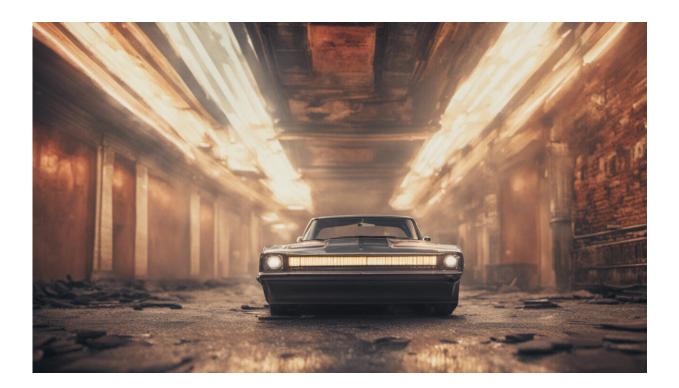# Game not over for retro games

January 9 2013

Credit: AI-generated image (disclaimer)

Generations of children around the world were weaned on computer games like 'Pac-man', 'Galaga' and 'Donkey Kong', to name just a few. Indeed many of today's first-rate computer programmers, scientists and researchers took their first computer steps on such games. As with many toys, they were put aside and replaced with new ones.

However, the games have not been forgotten: thanks to a partly EU-

funded project, we have the necessary tools to enable us and future generations to access these games long into the future. The KEEP ('Keeping emulation environments portable') project received EUR 3.1 million in research funding under the 'Information and communication technologies' (ICT) Theme of the EU's Seventh Framework Programme (FP7). This amount covers around three quarters of the total KEEP project budget.

Thanks to the efforts of devotees, libraries, museums and national archives, much of this digital heritage is well preserved. Many copies of legacy software, from early video games to high-end professional software suites, have been collected as artefacts of the early digital age. However, this software is stored in floppy disks and gaming cartridges: unless you have an old-school gaming device, computer or even the correct monitor, actually running the games is nigh on impossible. Moreover, what happens when the remaining old equipment breaks down and cannot be repaired?

The KEEP project came up with a solution: emulators. An emulator is a software application that runs on modern computers - or even over the Web - and simulates the hardware and system components of outdated computers. An emulator is a virtual machine. A Commodore 64 emulator, for example, will let you run Commodore 64 games, while a Game Boy emulator will bring Super Mario back to life ... and all this from the comfort of a modern-day computer device of your choice.

KEEP naturally recognised that emulators, being software, could themselves become obsolete. To combat this, project partners tried to make these emulators 'future-proof', so that they would be able to run on tomorrow's machines. They used the KEEP Virtual Machine as a platform; it can run emulation software but also be adapted easily to future unknown computer architecture specifications.

'The idea of KEEP was to give us all the tools we need so we are never locked out of old software,' explains Elisabeth Freyre of the National Library of France and coordinator of the project. 'We realised that you cannot rely on obsolete hardware to run the software - the hardware is a historical artefact itself. So we have to rely on emulators to render both static and dynamic digital objects of the past: text, sound, and image files, multimedia documents, websites, databases, videogames and so on.'

KEEP has developed a set of tools that will help archivists extract data from different types of 'carriers' (the way software is 'packaged') and convert the data into a useable, common coding format that is 'platform-independent'. This means the game is no longer a slave to the device it was made to run on, be it a standing game machine or an old Commodore 64.

The KEEP Media Transfer Tool Framework (MTTF) offers a convenient way to create an 'image' of a software carrier and store it on current digital media so it can be used by emulation services. This framework also follows the guidelines of the Open Planets Foundation for interoperability in digital preservation.

'The development of this framework for archiving legacy digital materials marks a great step forward in the preservation of our digital culture,' Mrs Freyre commented. 'We have made good technical progress, but we also understand the social context of what we are doing, so we have also produced a layman's guide to address the legal issues involved in copying and preserving software.'

KEEP points to its Emulation Framework as one of its key successes. While the framework is not an emulator itself, it is a software tool that can correctly identify the content of a file or carrier image and then launch the most appropriate existing emulator.

As a result of the project's far-reaching long-term perspective, they have ensured that our digital heritage is accessible for generations to come. 'There is no telling how important it is to preserve all our digital assets for posterity,' says Mrs Freyre. 'But without functional emulation in the future, the digital assets we save will be nothing more than the physical objects, the disks and tapes on which the software is stored. We have now provided future generations with a key for them to unlock the code and see what we see today - the pictures, games and applications that are so important to society today.'

More information: www.keepproject.eu/ www.openplanetsfoundation.org/

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