



## **Summary of the technical solutions implemented in the digital platform**



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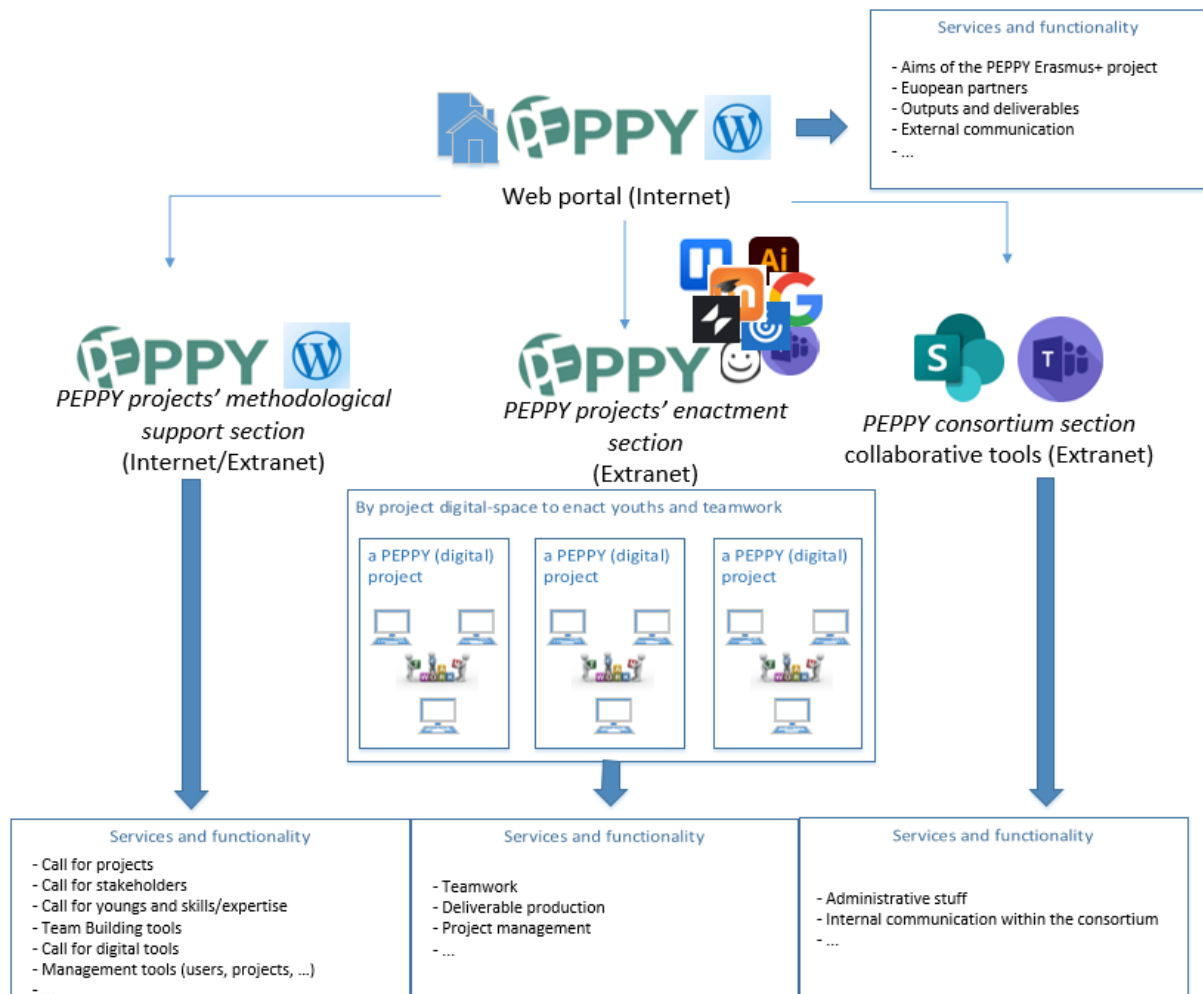


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# 1 General architecture of the support platform implemented during the Erasmus+ PEPPY project





The digital platform developed as part of the Erasmus+ PEPPY project takes over as a whole the functionalities announced in the Form application when the project was submitted. To meet the diversity of needs, these functionalities are divided into different modules/spaces operated via complementary web technologies.

- The core of the platform is operated via the WordPress content manager used for the editing and publication of content rendered for some (information on the European PEPPY project, deliverables, external communication ...) accessible to any Internet user (Internet) and for others only to authenticated users (Extranet) that are young people, their coordinators and administrators. This part of the platform makes it possible to manage the groups of young people that are formed and the life cycle of the projects (proposal by a sponsor, positioning and assignment of young people, start-up, implementation and end of the project, communication on proposed, ongoing, completed projects) The corresponding functionalities are easily identifiable in the previous figure because associated with the icon , 
- During the course of a project by young Europeans, the platform offers support for the production of digital deliverables. By building the platform, as soon as a project is validated as being able to start, each project group is offered:



- Web access to a virtual desktop () allowing you to use various professional software (, , , , , , , , , , ...) deemed useful to collectively produce, record and evolve the files of their project.
- Web access to a collaborative work environment (, , ) so that young people and their coordinator can carry out the management tasks of the project carried out and deposit their deliverables in the sharing spaces provided for this purpose.

For project coordinators and youth groups using only web applications to produce their deliverables or for which the institution provided the necessary software, only the use of a collaborative web work environment was imposed and made accessible via the platform, as well as a pre-established file organization. After many discussions, the choice of the editor of this collaborative work environment was left to the discretion of each project coordinator.

- Finally, the digital platform provides access to a coordination space between the PEPPY consortium partners, also accessible from the host portal. This part of the project platform, decided by ANTIC as coordinator of the Erasmus+ PEPPY project, is implemented on the basis of the solutions offered by Microsoft Sharepoint/Teams (, ) for all synchronous/asynchronous collaborations and for file sharing within each PEPPY project work-package. All the exchanges/interactions/productions of the consortium members are thus kept for operational management purposes of the PEPPY project but also for archiving.

## 2 Technical solutions implemented

### 2.1 Solution for the PEPPY portal and the integration of other software bricks

To meet the expected functionalities, it is naturally towards the use of a content manager (or CMS) that the project was oriented. This type of web application allows the editing of content by writers who can focus on the content via a WYSIWYG interface that offers a graphical formatting interface similar to that which exists in a word processor. The homogeneity of the layout is ensured thanks to presentation templates (or templates) totally adaptable to the needs of a project.

Among the free content management solutions (cf. Drupal, typo3, Wordpress, Joomla), it is the Wordpress solution that was chosen, both for its very wide distribution, the quality of its documentation, its ease of installation and the richness of the extensions to extend the basic operation of this content manager.

The developments then consisted in customizing Wordpress at the service of the project after having:

- chose the appropriate extensions and set them up,
- Define the graphic charter and create a presentation template for each of the types of pages to edit and display.

The role system set up for each type of user (unauthenticated Internet user, young person, coordinator, administrator) has made it possible to develop the PEPPY portal (Figure XXX-1 and XXX-2), to customize the administration interface (see Figure YYY-1 and YYY-2) to allow each type of user who has to edit content to have the functionalities to manage / administer projects, users and their roles, coats of arms, personas and news, ...





Figure XXX-1: Portal and information accessible to any Internet user

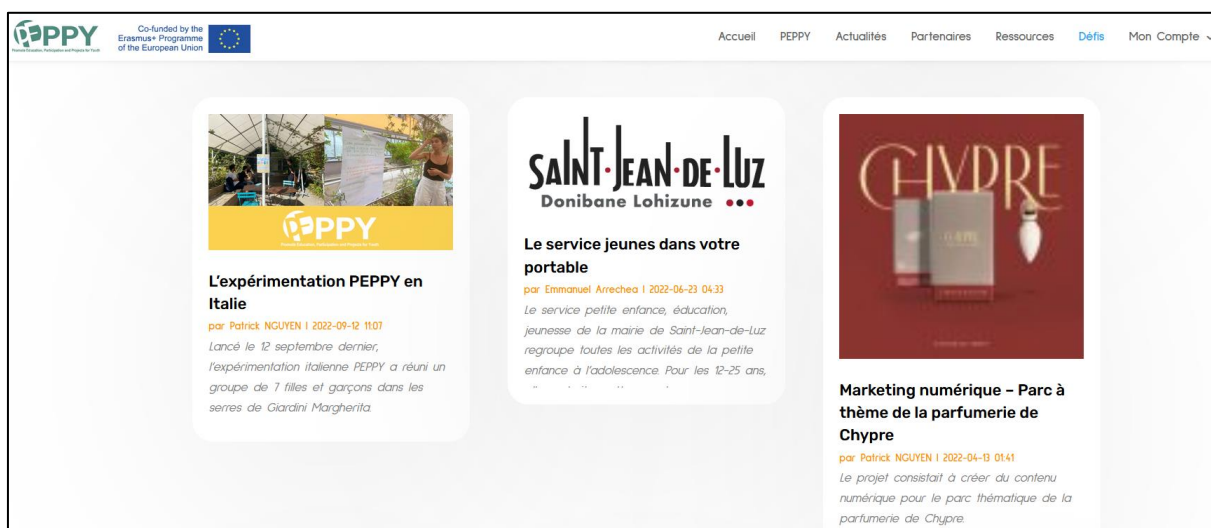


Figure XXX-2: The Challenge Presentation Interface

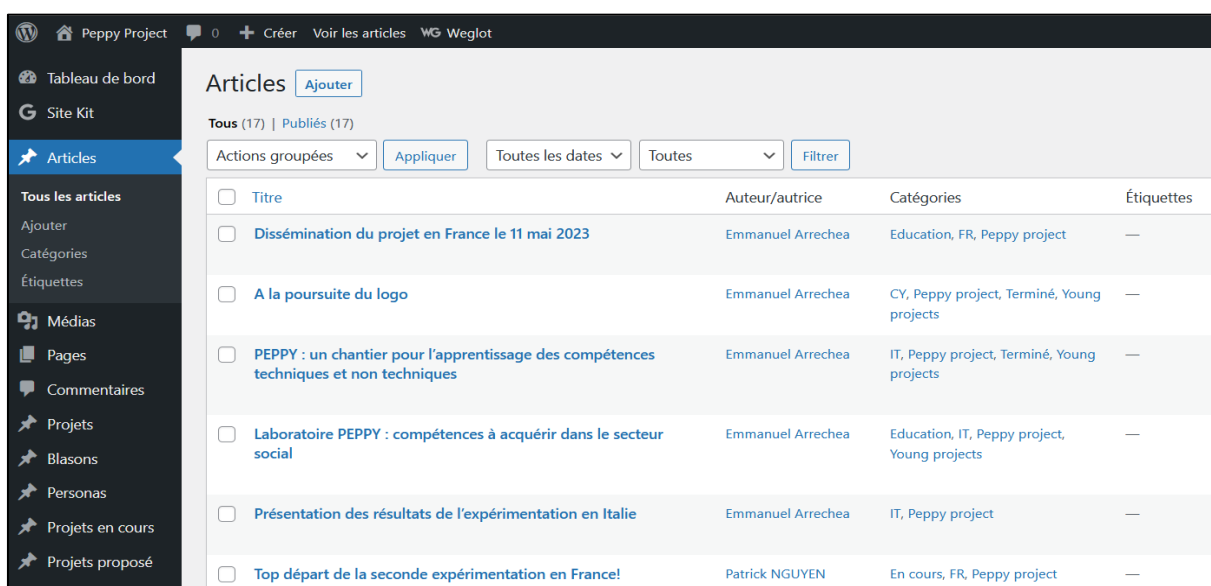


Figure YYY-1: Administration interface for editing WordPress content



## persona\_mrodrigues

Saisir « / » pour choisir un bloc



### Plus de champs

Propriétaire du persona \*

Matteo Rodrigues

Photo de profil

Ajouter un fichier

Phrase culte

on va voir si je suis pas capable

Je suis plutôt à l'aise avec les autres

50

Veillez sélectionner une valeur entre 0 et 100, 0 = Timide, 100 = A l'aise avec les autres

Je suis plutôt un leader

50

Veillez sélectionner une valeur entre 0 et 100, 0 = Suiveur, 100 = Leader

Je suis plutôt déconnecté

50

Veillez sélectionner une valeur entre 0 et 100, 0 = Connecté, 100 = Déconnecté

Mon niveau de créativité

80

Veillez sélectionner une valeur entre 0 et 100, 0 = Pas créatif, 100 = Très créatif

Mon niveau de débrouillardise

50

Veillez sélectionner une valeur entre 0 et 100, 0 = Pas débrouillard, 100 = Très débrouillard

Mon niveau d'optimisme

50

Veillez sélectionner une valeur entre 0 et 100, 0 = Pas optimiste, 100 = Très optimiste

Mes passions | Mes loisirs

langues :  
français  
anglais  
espagnol  
prog :  
c++  
html  
css

Mes objectifs PEPPY

points forts par rapport au projet à mener :  
esprit d'équipe  
pensif donne des idées  
leader

Mes envies de projet PEPPY

compétences complémentaires aux miennes à trouver pour le projet :  
énergique  
organiser  
motivé

Figure YYY-2: The Authenticated Youth Persona Editing Interface



## 2.2 Cloud solution to facilitate cooperation and project management tasks for young people and their coordinator during PEPPY challenges

It would not have been reasonable and efficient to want to develop a specific Cloud solution with WordPress for the sole advantage of seeing it fully included in WordPress. The reality was also that young people already mastered cooperative work platforms, some of which could be institutional (Moodle, Teams, Google Suite), but just as often platforms used outside our institutions (Discord). It is clear that for these young people aged 18 to 25 as well as for the coordinators of the challenges/projects, developing a PEPPY-specific solution would have led to less efficient results than the cloud solutions mentioned above.

The many discussions with the partners representing the project coordinators also convinced us not to impose one collaborative work platform rather than another, but rather to allow each coordinator to specify, for a given project/challenge, the links to the chosen cloud platform and the means of connection for young people.

## 2.3 Virtual office solution for the production of deliverables by young people during PEPPY challenges

■ The solution chosen (and the tasks carried out for its implementation)

For the purposes of our Erasmus+ project we had to configure a server that the IUT had previously acquired and on which we had installed a hypervisor with Citrix's Xen Server solution. Reading the form application, the possible needs of young people, tutors and teams, we saw the need to create simplified and ready-to-use solutions.

We have redesigned virtual desktops, their architecture. It was necessary to make several different machines, with software, security and the first idea was that young people came to use a bit like the market or virtual machines on "off-the-shelf".

A key point was also the implementation of virtual machines in French, English and Italian (multilingualism). This part was complex to analyze and perform. It was necessary to identify the accounts of young people upstream and according to the groups of affiliation it was necessary to adapt the language of the operating system (OS). After several weeks of testing we managed to open and save the language settings, software ... in the user's profile automatically.

A point on the operating system (OS), we have the choice between the Ubuntu solution or the Windows solution for the virtual desktop. In order not to have confusion with young people, we have chosen the most used system in the Windows world. Citrix requires us to use the last two versions maintained by Windows (Windows 10 or 11). In 2021 we selected windows 10 and installed all security updates and patches.

To complete the security part we have decided not to allow users to install software in their environment (standard user account). Another aspect is that we used the random desktop option, where the machines are not dedicated and after each logoff, the virtual desktop reboots and rebuilds its image from scratch. This can prevent corruption and significantly improves the security of systems. The documents are saved in the user profile in a dedicated space.

Regarding the documents we have redesigned at least two spaces:

- A personal space with the user's name and a mapped network drive (for documents of the young person or tutor that are not intended to be shared with members of the project / pappy group)
- A space shared with the entire peppy group to facilitate collective work. We also performed a network mapping



- A space with the local drives of the local computer has also been allowed (example I want to recover a document, shared it from my pc to my Citrix space)

To sum up, we have proposed virtual workspaces so that young people work "equally" with efficient, ready and secure tools. Education software with appropriate licenses. Several aspects have been redesigned to adapt the solution to our Peppy project and facilitate collaborative work from any device (computer, tablet, mobile phone...) connected to the internet.

### The technical functioning of the virtual desktops at the service of the project

Desktop virtualization is a technology that allows users to simulate a desktop workload to access a desktop from a connected device. This separates the desktop environment and its applications from the physical client device used to access them. Remote desktop virtualization is an approach to virtualization that occurs in a server-based computing environment. It allows users to run operating systems and applications from a server within a data center, while all user interactions take place on a client's device (laptop, thin client, smartphone). This type of virtualization provides increased centralized control over applications and desktops, and maximizes the company's investment in IT hardware through remote access to shared IT resources.

A virtual desktop infrastructure (VDI) is a variant of the client/server model applied to desktop virtualization, it uses hosted virtual machines (VMs) to deliver persistent and non-persistent virtual desktops on any type of connected device. These workstations can optionally be accessed via the cloud from any computer hardware (PC, tablet, phone) and from anywhere. This is called DaaS (Desktops-as-a-service), users then having access to a virtual desktop, either through a web browser or through an application installed on their own hardware.

With a persistent virtual desktop, each user has a unique desktop image that they can customize with applications and data, knowing that these will be backed up for later. A non-persistent virtual desktop infrastructure allows users to access a virtual desktop from a collection of machines when they need it. Once the user disconnects from a non-persistent VDI, it returns to its original state. This type of virtual desktop infrastructure provides increased security and centralized desktop management within an organization or enterprise.

The Bayonne IUT chose in 2016 to deploy Citrix technology for the implementation of its VDI architecture. The figure below describes the main components of deploying a VDI site architecture with Citrix.

At the heart of such an architecture are controllers and hypervisors; It is these hypervisors installed on the host physical servers that host the virtual machines that can be made available to users. An active directory is used to manage user authentication; A database is used to keep track of all user session and configuration information. The license server manages the Citrix licenses available for the site. configuration tools (Studio) and session monitoring (Director) are used to administer the site; StoreFront authenticates users and manages the desktop and application stores that users access. The Citrix Gateway is used to secure connections when users connect from hardware outside the organization or enterprise. Users use either their web browser to access and leverage their catalog of available desktops or a dedicated app (Citrix Workspace App):



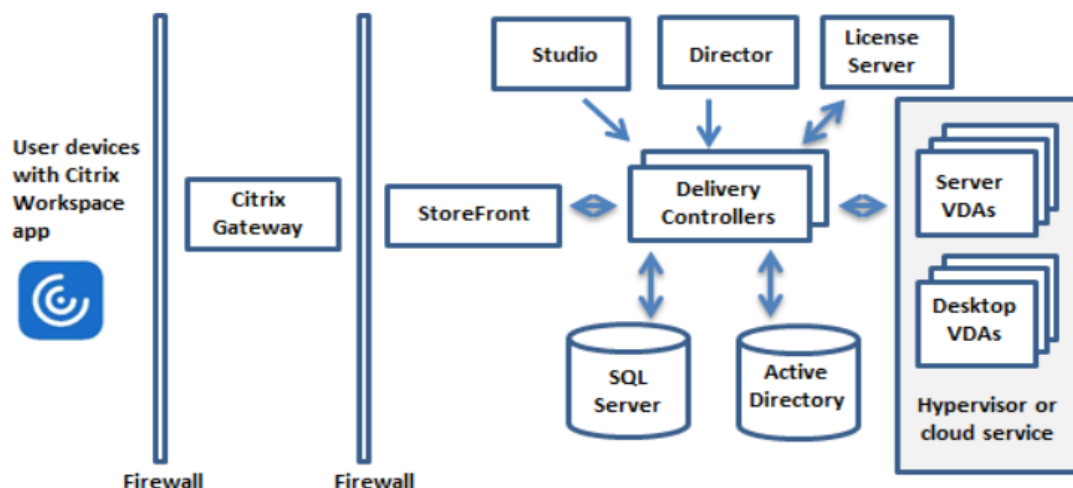


Figure 1 :Core components of a Citrix architecture-based site

It should be noted that the previous figure does not show the network equipment, SSD arrays and other equipment on which such an architecture is based, if only to manage the data exploited by users of virtual desktops. It is also a strength of the approach to integrate and know how to take advantage of the other equipment constituting the IT architecture of the IUT.

The IUT currently has 12 hypervisors capable of serving the needs of these 1000 students and these 80 staff that they need a non-graphic virtual office (office including the software necessary to do the vast majority of TP in IT, management, commerce, industrial engineering and maintenance; offices for the administrative and financial management of the IUT; ...) or graphic offices (exploitation of the Adobe multimedia design suite, exploitation of graphic design tools such as SolidWorks, exploitation of a chain of design and simulation tools for architecture, engineering and construction type Revit). Access to any of these desktops by a user is subject to the following constraints:

- The user must have login permission in the IUT directory and be authenticated.
- The user must be authorized to operate this or that office of the machine catalog
- The infrastructure is able to assign a Citrix license to the user trying to log in (the 300 licenses are shared among the 1000 users). For graphics desktops, the infrastructure must also be able to assign an Nvidia graphics license to each virtual desktop using it (the licensing mechanism is transparent to the user). The IUT has 194 to date.

Access to software made available by a virtual desktop may also be subject to checking the availability of a license for that user (a license server typically assigns one token from among those available to the user who requests it). The professional software of the IUT is subject to Education license usable by students and in the context of R&D work, but in this context these software are not intended to be used for industrial purposes.

### 3 Transferability of the digital platform to other actors for the implementation of other European projects

The different bricks of the digital platform are transferable and the actors of the Workpackage have taken care to produce content that facilitates:

- Its appropriation:
  - User guide of about thirty pages allowing anyone with a minimum knowledge of Wordpress content manager to use the features offered:
    - How do I create an account?



- How do I log in?
- How do I propose a challenge?
- How do I change my account information?
- How do I add a persona?
- How do I view a persona?
- How do I create a coat of arms?
- How do I add another coat of arms?
- How to consult / modify the coat of arms of a project group?
- How do I start a new challenge/project?
- How do I view / edit a project?
- Methodological and technical manual for the use of a virtual office:
  - Prerequisites:
    - Have put together a Peppy team
    - Open a user account with the service provider
    - Have a reliable internet connection
  - The process and implementation:
    - Expression of digital needs, useful software for a PEPPY challenge
    - Optional: Citrix Workspace Client Installation
    - Using a Citrix Virtual Desktop (With its internal browser or with the Citrix Workspace client)
- Its reinstallation on a web server: we provide deliverables in the form of documents allowing the reinstallation of all the bricks developed under Wordpress namely:
  - A document specifying the installation prerequisites, how to retrieve the latest version of Wordpress and which plugins to install before using the backup of the PEPPY project
  - The saving of the PEPPY project as a single file integrating the database and all the settings of the different plugins used.

French and international copyright applies to the bricks of the platform that have been designed and coded within the IUT of Bayonne as part of the PEPPY project. The operation by third parties of the platform is authorized and free of charge but users must expressly inform the IUT and ANTIC before any reuse, reinstallation, or extension of the digital platform. The IUT, ANTIC and the European project PEPPY must be explicitly mentioned when using the code of the digital platform by a third party.

The technology allowing the operation of Virtual Desktops through a simple Web connection is based on a hardware and software infrastructure that the IUT has made available to the actors of the European PEPPY project. Although the IUT is not able to maintain external access beyond the duration of the project, an entity wishing to offer this type of service can nevertheless rely on the results obtained and the guides provided to configure a comparable solution.

The services offered by Citrix are numerous. The easiest way if an institution cannot invest in technical staff training and infrastructure is to use the service: Citrix DaaS. "Citrix DaaS (Desktop as a Service - formerly Citrix Virtual Apps and Desktops Service) provides virtualization solutions that give IT staff control over virtual machines, applications, and security while providing access to any device. Users can use apps and desktops regardless of the operating system and device interface. »

You can have more information here: <https://docs.citrix.com/fr-fr/citrix-daas/overview.html>

It is a solution that may not be very expensive (from 10 USD / month) as long as the requested configuration is well sized in relation to the needs of users.  
<https://www.citrix.com/products/citrix-daas/>



Other proprietary solutions are also possible, such as the so-called "turnkey" cloud services offered by **Azure**, Microsoft's cloud platform with more than 200 products. After a registration and a few steps; it is possible to test and use for example an Azure virtual machine (limited to 750h or 12 months ...). More information here: <https://azure.microsoft.com/fr-fr/free>

**AWS** for Amazon Web Services is Amazon's platform. Similarly with Azure's free offer, you can try the product for 40 hours: "Computing for the end user" or "Secure streaming of desktop applications on a browser". More information here: <https://aws.amazon.com/fr/free>





**In the free world**, we do not know of any free software that offers a solution equivalent to a virtual desktop solution.






## 4 Resources made accessible to appropriate and reinstall the digital platform

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	IT
	UK

O2 Digital platform > O2 - Final delivery > FR 	
	Nom ▾
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	Mode emploi Plateforme numérique PEPPY
	Ressources pour Transfert-Restoration Plateforme PEPPY
	Architecture générale de la plateforme PEPPY et bilan techno.docx










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## O2 Digital platform > O2 - Final delivery > UK

 Nom ▾
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  PEPPY digital platform user-guide
  PEPPY Virtual desktops user-guide
  PEPPY platform's General Architecture & technical considerations.docx

## O2 Digital platform > O2 - Final delivery > UK > PEPPY digital platform user-guide

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  User manual.pdf	Il y a 18 minutes

## O2 Digital platform > O2 - Final delivery > UK > PEPPY Virtual desktops user-guide

 Nom ▾	Modifié ▾
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  WordPress Plugins for PEPPY platform.xlsx	Il y a 4 minutes	Thierry Nodenot