A Digital Signage System for DETI

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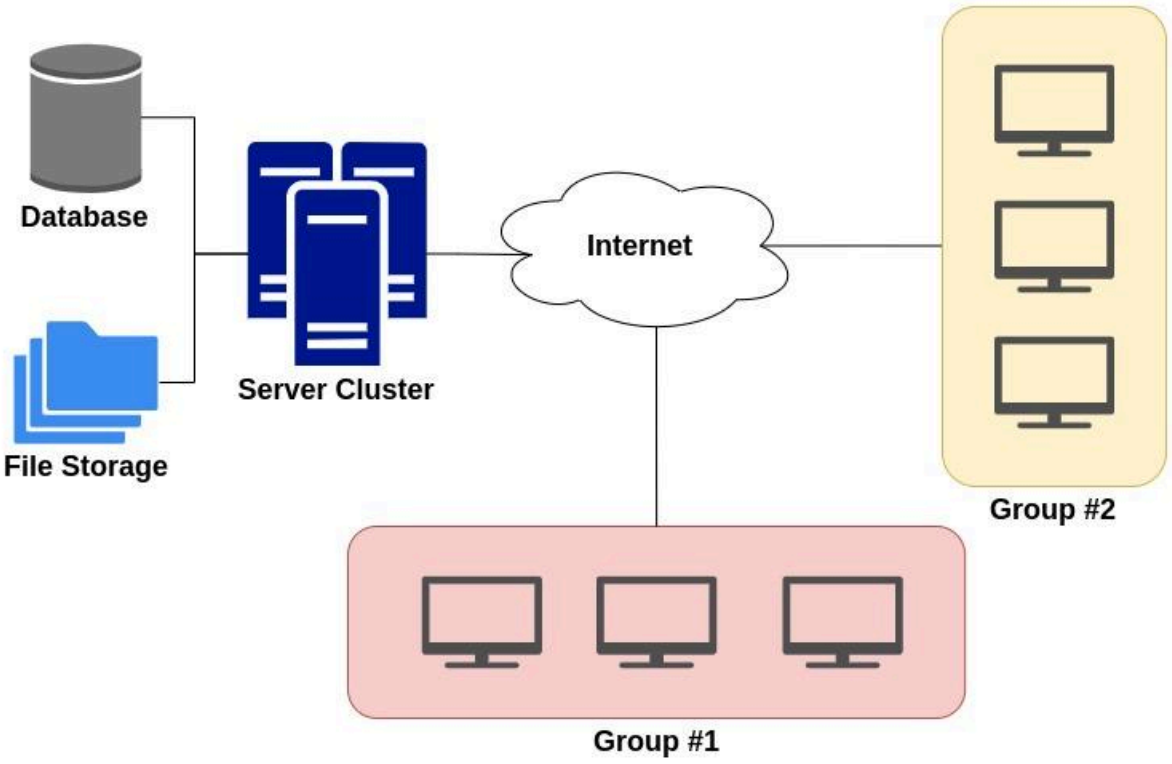
Group Size: 4 to 6

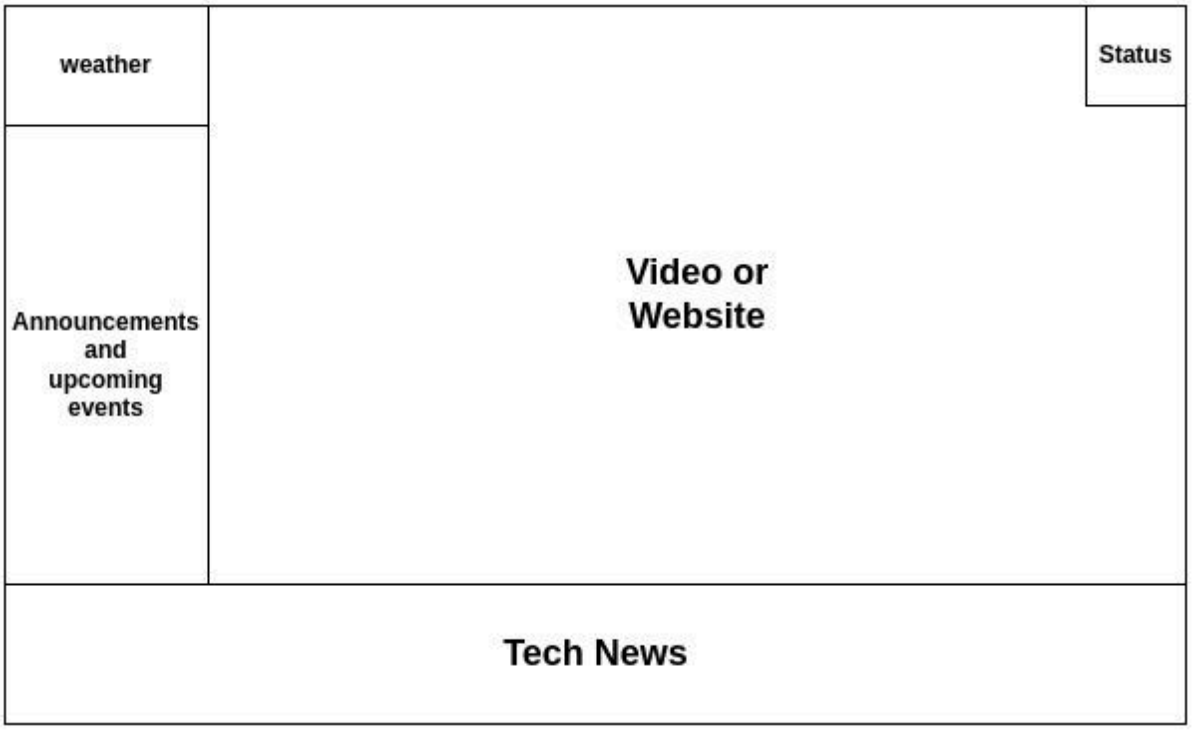
Description:

The main goal of this project is to design and implement a Digital Signage System. Digital Signage refers to the use of electronic displays, ranging from televisions to projectors, to showcase multimedia content such as text, images, videos, and interactive elements. Unlike traditional static signage, digital signage provides a dynamic and customizable platform that enables real-time updates, targeted messaging, and a more immersive viewer experience. From retail spaces to educational institutions, corporate environments, and public venues, these systems have become ubiquitous, reshaping the way information is presented and consumed. Digital Signage Systems improve the accessibility of information, especially in public spaces and institutions. They can serve as wayfinding tools, display event schedules, and provide important announcements, ensuring that information is easily accessible to a wide audience. The expected outcome of this project is an open source Minimum Viable Product (MVP) of a Digital Signage System to be used in our department (*i.e.* DETI) and, perhaps, throughout the university.

The students will have to propose a possible architecture for the system that will be reviewed by the tutors. After finalizing the design of the system architecture, the students will have to create a Media Player (MP) for the electronic displays to display the content on the actual screen capable of receiving real-time content updates from different sources. Besides the player, the students should develop a Content Management System (CMS) to manage all the screens and information templates, control what is being displayed on each screen, and allow scheduling and timing content playback. Lastly, the students should develop a basic Content Creation Tool (CCT) to assist users in the design of the templates. Both the CMS and the CCT should use the university's Identity Provider (*i.e.* users should be able to login using their university's credentials).



High Level Architecture



Template example

Requirements:

- Media Player (MP):
    - Receive and playback content received from the CMS
    - Receive real-time content updates from different sources
    - **Render content that may have origin in external APIs (*e.g.* time.ly, university news)**
    - Work online or **offline**
- Content Management System (CMS):
    - Create, manage, and schedule content for display
    - Create, and manage screens
    - Organize screens in groups
    - Manage multimedia content such as images, videos, and text
    - Manage templates
- Content Creation Tool (CCT):
    - Create and edit templates
- Create a OS Image with the MP to boot Raspberry Pi or other similar small single-board computers
- All the tools used during this project must be free/open source
- Tests and clear documentation, since the project must be open source and maintainable

Possible Challenges:

- Integration with the university's IDP may take some time due to bureaucracies
- The students should implement test driven development
- Creating a user friendly Content Creation Tool (CCT)

Expected Results:

- MVP of a Digital Signage System
- User-friendly CMS and CCT
- Integration with the university's IDP
- OS image that auto-boots into the Media Player upon startup
- All the code should include tests and comments
- Clear documentation and contribution guidelines
- Knowledge about how to carry out open source projects