

# Kjing (Mix the knowledge)

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## ABSTRACT

Kjing is a web app that allow to rapidly set a multiscreen multi-device environment and to interact and distribute content in realtime. It can be used for museographic, educational or conferencing purpose.

We propose a demo for the “World Wide Web 2012 LYON - FRANCE” held in Lyon the 16th to 20th April 2012.

## Categories and Subject Descriptors

H.4.1 [Information Systems Applications]: Office Automation—*groupware, desktop publishing*

## Keywords

www2012, demo, kjing, realtime, screen, control

## 1. INTRODUCTION

### 1.1 Who are we ?

ERASME is a living lab, innovation service of a local authority in France : “Departement du Rhon” which is the public service that handles secondary schools, roads maintenance, social welfare services... for about 1.6 millions inhabitants around Lyon.

### 1.2 What do we do ?

ERASME scouts technologies and design new way to use digital innovations for schools, museums and elderly persons. We develop on line services and interactive installations that are used in administration and public services. We are specialized in on line learning environments, multitouch systems, internet of things solutions.

### 1.3 Why the Web ?

Today, the Web is available nearly everywhere. It is the most open technical solution to reach the broader range of devices.

With the latest technologies provided by HTML5, the frontier between native applications and Web applications is thin.

Thus, the Web is becoming the new development platform for many applications. Even for natural user interfaces and for mobile development.

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 ACM 978-1-4503-1230-1/12/04.

That’s why ERASME has decided to use web technologies as a platform for most of its developments.

## 2. KJING OVERVIEW

The “Departement du Rhone” will open a new museum in Lyon in 2014 : the “Musee des Confluences”. ERASME is working on innovative technologies for this new museum.

Today, museums, specially sciences and society museums, make a large use of information technologies. Screens are popping around to display audiovisual content or to offer interactive experience. But when a guide is accompanying a group during a visit, all those displays and contents are generally in competition with its own explications.

The aim of Kjing is to empower guides and give them the ability to use all the screen of the museum to support their own presentations.

The name is a reference to D-Jing (as music mixing practice) and V-Jing (video mixing) where the K stands for knowledge (as in knowledge mixer).

This tool allow museum guides to display media (images, videos, audio, webpages, texts...) on any screen that is connected to Internet through a recent browser. The set up is very simple and scalable. In the demo you can watch on <http://vimeo.com/31911165> we demonstrate how we can settle a new interactive exhibition space with several screens in a few minutes.

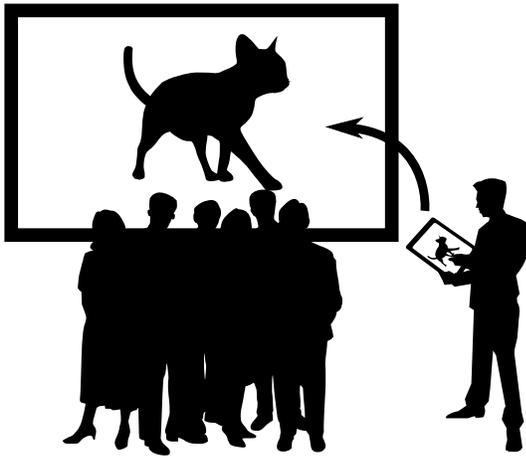
The guide prepare the session on a desktop computer, drag and dropping contents from his hard drive to the Kjing administration web page. Then, using a tablet device with a wifi access, when he is in the exhibition, he can very simply display his own content on the different screens of the exhibition space (dragging content on the icons representing the different screens available).

He can memorize settings and update all the contents of many screens in just one touch.

This bring different benefits :

- Focus attention of the audience. Instead of being in competition with the interactive or multimedia content of the exhibition, the guide can put it on pause, decide when to launch it, use it in coordination with it’s own speech.
- Adapt content to audience : the guide can adapt the content to his group. Using the correct foreign language, adapting the complexity, removing long texts for children...

The guide becomes the “conductor” of the exhibition.



**Figure 1: Sending content content from a tablet to a screen**

Furthermore, the guide can propose the visitors to transform their own smartphone into a Kjing client. He just need to direct their browser to the adequate URL, using QR-codes<sup>1</sup> or a captive portal<sup>2</sup>. The guide will see the different smartphones of his patrons in the interface of Kjing and can send them in real time personal and additional content wherever they are in the museum. It could be hints (“you are not far from what you are looking for...”), additional informations (this picture is the Xray of this sculpture) or instructions (“we all meet in 5 minutes at the entrance”).

With Kjing, exhibition are not anymore in read only mode for guides.

## 3. TECHNOLOGY

### 3.1 Clients

From the user point of view, KJing is made of two parts.

#### 3.1.1 Kiosk

The kiosk is a Web application that is used to display the media. This Web application has been entirely written in javascript.

Thanks to the nature of the Web, the Web application is stored in one place and this allows the kiosk to display all the media available on the Web (images, videos, texts, rich texts but also Web sites and Web applications).

#### 3.1.2 Administration console

The administration console is also a Web application which allows to publish the media, setup the kiosks, control the kiosks and even see what other guides are doing on the others administration consoles.

This Web application is working on desktop/laptop computers but also on mobile devices like tablets (actually iPad and recent Android tablets).

Mobile devices are mainly useful while in the museum with groups of visitors to control the kiosks.

<sup>1</sup>A QR code is a two dimensions barcode. See more at [http://en.wikipedia.org/wiki/QR\\_code](http://en.wikipedia.org/wiki/QR_code)

<sup>2</sup>A captive portal force user to see a given web page. See more at [http://en.wikipedia.org/wiki/Captive\\_portal](http://en.wikipedia.org/wiki/Captive_portal)

Desktop/laptop computers are mainly used to manage the media library.

But roles can be inverted if needed.

For this Web application, we chose to massively use drag&drop and file drag&drop to minimize the user’s interactions complexity in limiting the number of steps to get the job done.

For this purpose, we used the latest file drag&drop API available in modern Web browsers. For the other browsers, we provided alternative solutions.

### 3.2 Server

Like any Web application, we need to have a server part. In this project, we have two server parts.

#### 3.2.1 File handling

This first part is made of an Apache2 daemon with PHP support.

This part handles the distribution of the two Web applications and also handles the media query, storage and distribution.

This is a “classic” Web server part.

#### 3.2.2 Kiosk handling

The second part is a home made daemon written in C# which runs under Linux using Mono.

This daemon is a WebSocket<sup>3</sup> daemon which implements the WebSocket draft 00 (implemented in Safari iPad) and draft 10 (implemented in Chrome desktop Web browser) of this emerging protocol.

As WebSocket is still in an early stage, we also provide an emulated version of the WebSocket on top of XMLHttpRequest for the other browsers.

This daemon provides the two way communication needed by the kiosks to receive the orders of what they need to display.

It also provides to the administration console, a way to send orders to the kiosks and receive their status if changed by others administration consoles.

This daemon is the very interesting part of the server because it shows the new way a Web application can interact with a server and allow “real time” interactions unlike “old school” Web applications.

## 4. WEB TECHNOLOGIES IN USE

This list is not exhaustive but gives an idea of the Web technologies we used to develop this project:

- SVG<sup>4</sup>
- VML<sup>5</sup>
- Canvas<sup>6</sup>
- HTML5 Video<sup>7</sup>

<sup>3</sup>The WebSocket protocol enables two-way communication. See more at <http://tools.ietf.org/html/draft-ietf-hybi-thewebsocketprotocol>

<sup>4</sup>SVG: <http://www.w3.org/TR/SVG/>

<sup>5</sup>VML: <http://www.w3.org/TR/NOTE-VML>

<sup>6</sup>Canvas: <http://www.whatwg.org/specs/web-apps/current-work/multipage/the-canvas-element.html>

<sup>7</sup>HTML5 Video: <http://www.whatwg.org/specs/web-apps/current-work/multipage/the-video-element.html>

- WebSocket<sup>8</sup>
- FileApi<sup>9</sup>
- File drag&drop from<sup>10</sup> and to the desktop<sup>11</sup>
- Touch events<sup>12</sup>
- RequestAnimationFrame<sup>13</sup>

All these technologies were wrapped in a javascript library we developed to ease Web applications development.

This library is called **ERajs** and early versions are available at <http://erajs.org/>.

## 5. LICENSE

The **ERajs** library is available today under the MIT License<sup>14</sup>.

The administration console, the kiosk and the home made daemon are also developed under the MIT License but no public communication is done on this project and not all parts are publicly available today.

Things will probably change when the project becomes more mature and raises enough interest.

## 6. DEMONSTRATION

For demonstration purposes at the “World Wide Web 2012 Lyon”, we will provide a Wifi Access Point with a strictly Local Area Network.

A laptop will be used with an external screen in clone mode to show how to use the administration console.

We will also use an iPad2 to show the administration console in a mobile context.

Two kiosks will be provided to display the media controlled by the administration consoles.

Each kiosk is made of a 24” screen with a small form factor computer connected to the screen.

And we will use devices from the audience as additional kiosks.

A demonstration takes between 20 to 30 minutes and can last longer depending on the audience’s questions.

## 7. CONCLUSIONS

We hope this project will retain your attention. To see more about this project, you can watch a short movie on Vimeo : <http://vimeo.com/31911165>

## 8. ACKNOWLEDGMENTS

Kjing’s concept was designed by Emmanuel Maa Berriet, Laurent Chicoineau et Thierry Malarmey during the Museolab3 workshop, and redeveloped with web technologies by Daniel Lacroix.

<sup>8</sup>WebSocket: <http://tools.ietf.org/html/draft-ietf-hybi-thewebsocketprotocol>

<sup>9</sup>FileApi: <http://dev.w3.org/2006/webapi/FileAPI/>

<sup>10</sup>File drag from desktop: <http://www.w3.org/TR/html5/dnd.html>

<sup>11</sup>File drag to the desktop: <http://www.thecssninja.com/javascript/gmail-dragout>

<sup>12</sup>Touch events: <https://developer.apple.com/library/ios/#DOCUMENTATION/AppleApplications/Reference/SafariWebContent/HandlingEvents/HandlingEvents.html>

<sup>13</sup>RequestAnimationFrame: <https://developer.mozilla.org/en/DOM/window.requestAnimationFrame>

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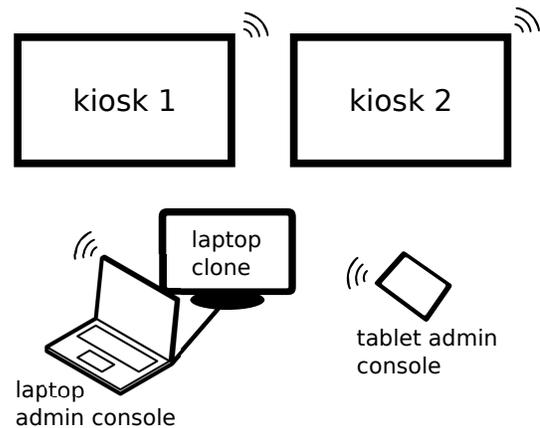


Figure 2: Possible demonstration stand