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DEVELOPING AN ACCESSIBLE VIDEO PLAYER

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Abstract: Online Channels in financial institutions allows customers with disabilities to access services in a convenient way for them.

However, one of the current challenges of this sector is to improve web accessibility and to incorporate technological resources to provide access to multimedia and video content, which has become a new form of internet communication.

The present work shows in detail the strategy followed when designing and developing the new video player used by Bankinter for these purposes.

Keywords: *Multimedia, Video player, Accessibility, Internet, Financial sector.*

Background

One of the challenges that directly affect online banking is web accessibility. In other words, that all people can accessing to all web content, independent of the limitations of the individual (disability) or of the context of use (technological or environmental) [1].

Several studies of disability in Spain [2] are emphasizing about the impact of age as a factor in the growth of the population with disabilities (in year 2008 there are 3.85 million disabled people, near at 1% of totally Spanish population).

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Table 1. Variables of impact in population disabilities

People between 6 year or more with disability		
	Rates per thousand people	
	Men	Women
Mobility	42,6	77,5
Domestic life	29,5	69,7
Self care	31,3	55,3
Hearing	21,9	28,4
Visión	17,8	28,4
Communication	16,3	18,6
Learning and development tasks	12,7	17,1
Social Interaction	14	15,4
Totals	72,6	106,3

These studies also show us, the fact that the mobility of persons is the major type of disability (see Table 1. Variables of impact in population disabilities), this last data is not only important for urban accessibility, but also for the importance to access bank services without having to travel.

For this reason, the possibilities offered by the "Online Banking" are evident [3] to improve services offered to customers with restricted mobility.

However, some studies focusing in to review the state of web accessibility criteria in Spain are showing the lowest percentage of successful at the online banking (see e.g. [4]) in the last years.

More exactly, 30% of the Spanish financial institutions do not fulfill the requirement WAI AA established by the legislation, and only 38% of these institutions reach accessible criteria to the transaction services.

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Accessibility in video content

Nowadays, there is a consolidated tendency to present video content on Internet.

There are several impacting data about audience video [6], we can see an example in February 2011, 170 million American internet users watched this type of content, and the average hours per month dedicated to watching them amounted to 13.6 hours.

Table 2. Use of video content in U.S.A

TOP U.S: Online Video Properties by Video Content Views
Ranked by Unique Video VIewers
February 2011
Total U.S.- Home/Work/University/Locations
Source: comScore Video Metrix

Property	Total Unique Viewers (000)	Viewing Sessions (000)	Minutes per Viewer
Google Sites	141,065	1.829,66	264,6
VEVO	48,998	222,11	81,2
Microsoft Sites	48,812	297,731	46,5
Yahoo! Sites	46,714	200,088	36,3
Facebook.com	46,661	170,319	18,5
Viacom Digital	45,214	229,856	74,2
AOL, Inc	38,773	137,362	23,1
Turner Digital	27,447	87,652	25,3
Hulu	27,257	143,461	224,3
NBC Universal	24,185	53,136	20,4
Total Internet: Total Audience	**169,646**	**5.038,49**	**816,4**

In case of web TV content, now there are initiatives like the recently approved in the U.S. (the Twenty-First Century Communications and Video Accessibility Act of 2010), in which both manufacturers and Web TV content servers should take commitment to the inclusion of measures of accessibility as the activation of closed captioning.

However, for the specific case of web TV content, and the rest off video content, the accessibility requirements affect not only at the content, but also to the interface used in the reproduction.

On the other hand, for Bankinter as well as for others Banks, the video contents are powerful resources to make marketing action to clients, to give information about financial products and services, and to give advice services.

However, to include these contents it needs more effort because is more difficult to satisfy WAI guidelines, and this can become an obstacle in relation to expected improvements in accessibility for the financial sector.

Figure 1. Banner with product information of Bankinter.

In this line is important to mention, that the most breached guidelines by financial institutions [4], correspond to basic requirements of accessibility (WAI level A), and the inclusion of video contents affect both the first level and the second.

So it is easy to deduce why actions are not been taken to adapt this type of requirement to the financial web sites.

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Reviewing the accessibility of video players in the financial sector

As commented in previous sections, accessibility studies in different sectors attributed the financial sector as one of the worst in compliance with the existing web accessibility standards.

However these studies don't have specific information about the accessibility of video content for this sector in Spain.

In order to extend this information, and assess the impact for making accessible this type of content in Bankinter websites, we have reviewed the Spanish financial sector during year 2010 [5].

To do it, we selected a subset of 11 Spanish financial institutions that are currently presenting videos on their websites. And we analyzed compliance with specific guidelines (see Table 3) for accessibility applicable to video content.

In general, our results show that none of the analyzed financial institutions meet all the requirements suggesting by the WCAG for both levels (A and AA).

For the specific case of the Level A requirements, the majority of these institutions only comply 4 features in this level.

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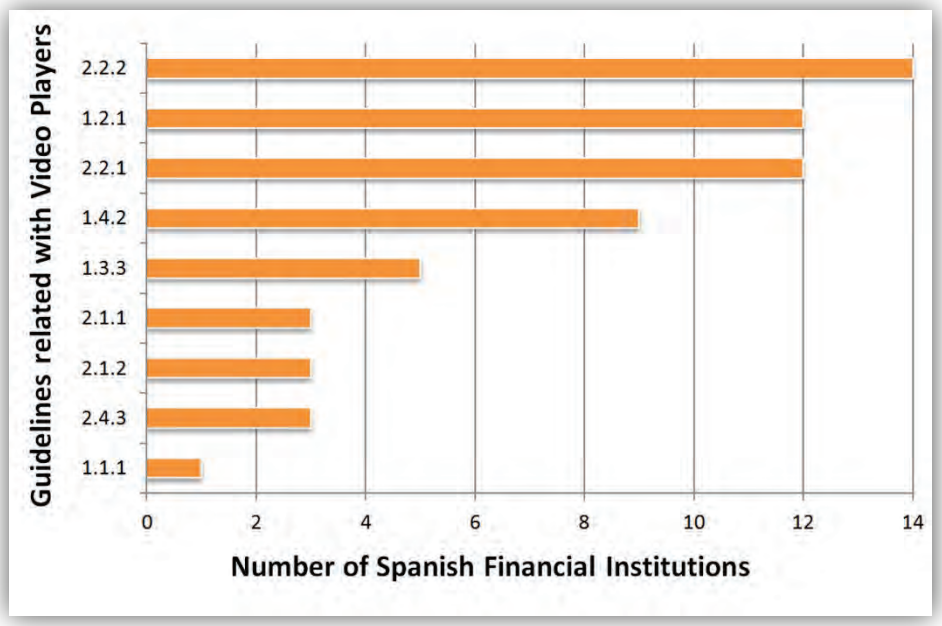
Table 3. Guidelines WAI levels "A" and "AA" applicable to video content.

Level	Guideline	Title
A	1.1.1	Provide altrenative text
A	1.2.1	Include pre-recorded audio or video content if the content is only video or only audio
A	1.3.1	Sensory characteristics of Interface components
A	1.4.2	Sound Control
A	2.1.1	Control by Keyboard
A	2.1.2	Retrieve the focus of the video player
A	2.2.1	Adjustable time limit video
A	2.2.2	Pausing and stopping the video
A	2.4.3	Logical paths in focus
AA	1.2.4	Subtitling
AA	1.2.5	Self-description
AA	1.4.3	Minimum contrast 5:4
AA	2.4.7	Focus with border visible

You can see the guidelines refer to existing features in most video players in the market, such as pause button, stop button and the scroll bar or sound control bar (with the exception of Guideline 1.2.1 which affect directly to the content).

Figure 2 Relationship of compliance with level A guidelines by Spanish financial institutions.



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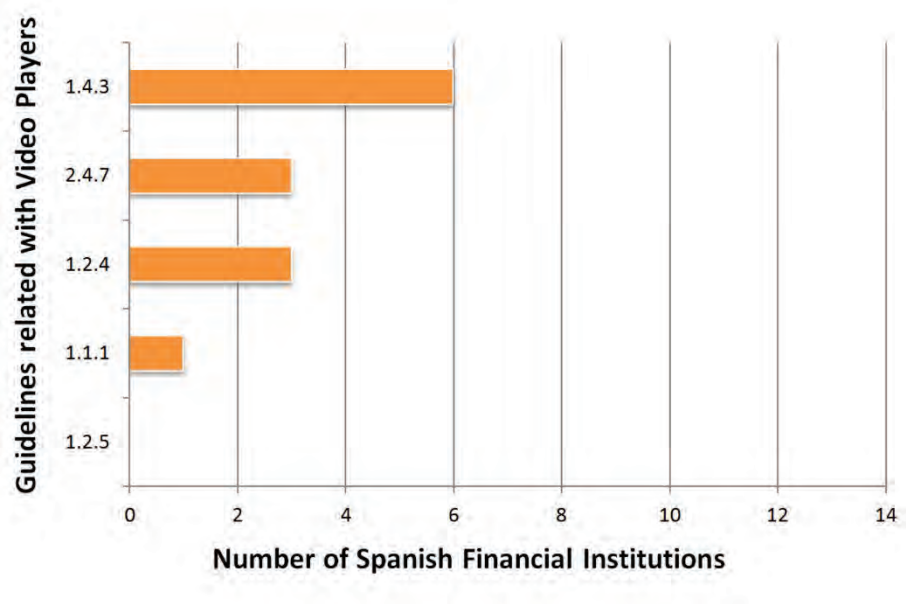
On the other hand, our results decrease significantly in the case of compliance with the guidelines of AA level, in this case none of the analyzed entities fails to reach half of the requirements placed on this level.

In relation to guidelines of level A, it is worth mentioning that 7 of 11 features of the video players used by these institutions are below of expected accessibility requirements.

In other words, most of the accessibility requirements not completed are related to the basic features expected of any video player.

Figure 3. Relationship of compliance with Level AA guidelines by Spanish financial institutions



Project Objectives

As we introduced in previous sections, the main objective of the project is having video content accessible in Bankinter Websites. This requirement is basic in Bankinter compromise with Corporate Social Responsibility.

The Internet architecture of Bankinter websites is based on streaming video servers, whose technology helps ensure the quality of the contents displayed

on Internet, without affecting the performance of other services of the Bank.

The technology adopted by Bankinter incorporates several technical requirements, to include in any alternative proposed in this project.

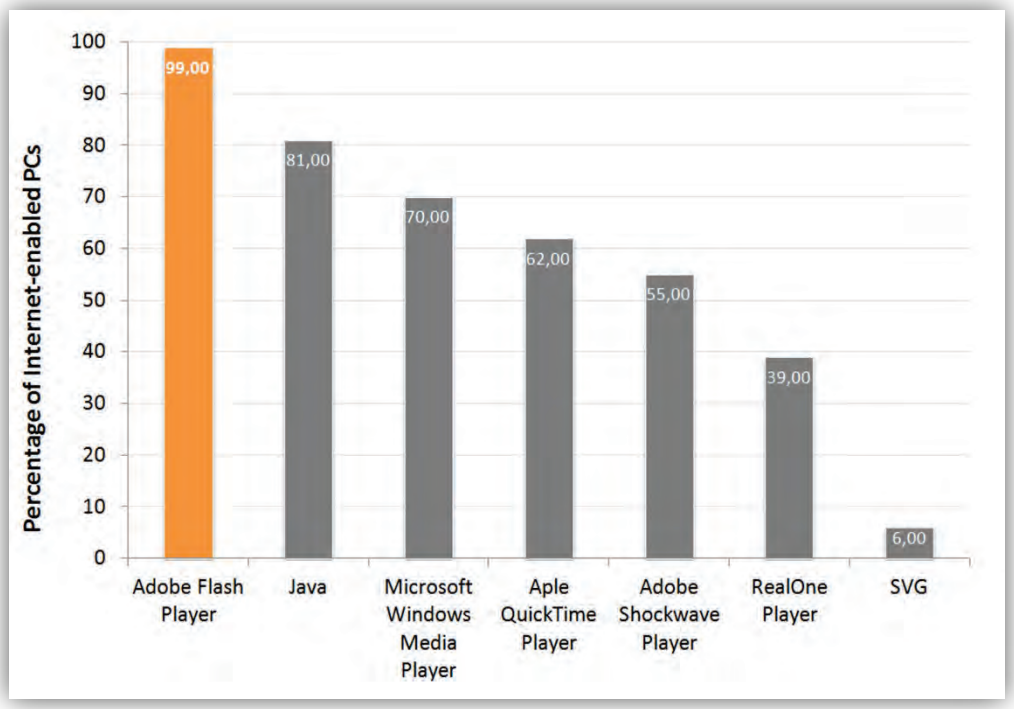
More specifically, functions related to broadcast video using RTSP (Real Time Streaming Protocol).

On the other hand, in 2010 the Bankinter web sites have begun migrating to new content management application; this project has set the highest priority in the Bank and regard to the accessibility of web content too.

Reviewing technological alternatives

Adobe Flash is a multimedia technology strongly used. It is used for everything, simple animations or complex interactive applications, and nowadays, Flash video (FLV) has become the leading video format on the web [6].

Figure 4 Distribution of different technologies of video players.



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As shown in Figure 4, today Adobe Flash technology is acquiring the highest percentage of use in the market.

For this reason, the main challenge in this study is to focus efforts on making this technology accessible.

Another decision made in this study is related with to the integration of video player in web sites. We can choice between: (1) make a video player only with JavaScript and DOM methods or (2) invoke an external video player with parameters <object>.

Both methods have their advantages and disadvantages, but after comparing these alternatives we was decided to develop a video player from components included in the framework of development of Adobe Flash.

And we focused in functions such as: (1) keyboard handling, (2), inclusion of captioning, (3) integration with adaptive technology, and (5) adaptation of readability and contrast conditions.

Features of Bankinter video player

The design of Bankinter video player was based on a set of international specifications for web accessibility, more exactly we considered the following standards:

a. Web Content Accessibility Guidelines 1.0
b. Web Content Accessibility Guidelines 2.0
c. Section 508 Standards

Based on these guidelines, we developed the first version of accessible video player (http://www.bankinter.es/), which has the following features:

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Incorporating alternative text to the video player

In cases where the user does not have flash component to load the video player, we display a substitutive image accompanied by an alternative text explaining the existence of the video player to the users (see Figure 5).

Figure 5. Definition of alternative parameters to the video player.

Contextualizing the content of video

Next feature is related to improve understanding of the content.

To prevent data loss by failures due to accessibility or usability, a good practice is to incorporate a summary of the video content. (See Figure 6).

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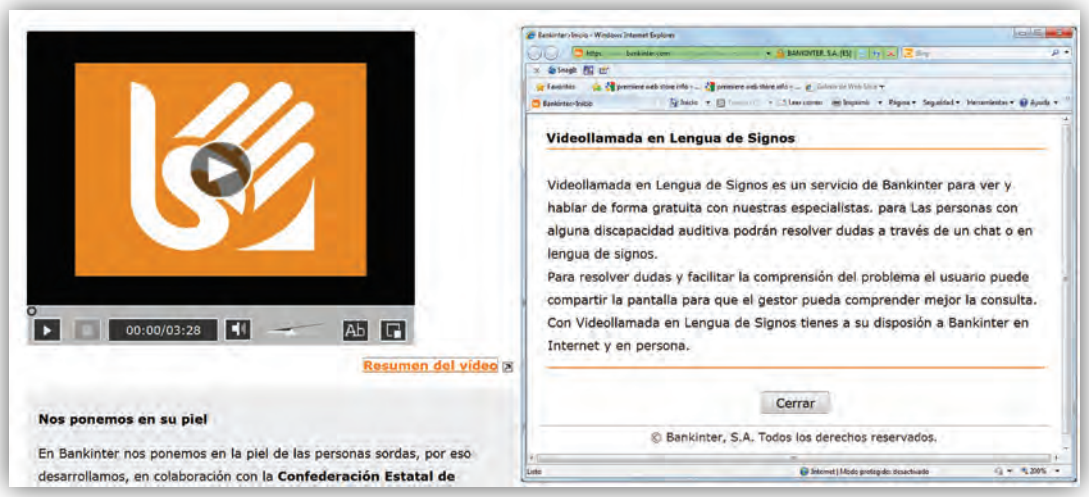
Figure 6. Summarizing media contents with the Bankinter video player.



Using Bankinter video player with keyboard

For people with disability main feature of the adapted technology is based on tracking the focus of interface components, these way users can interact with the applications.

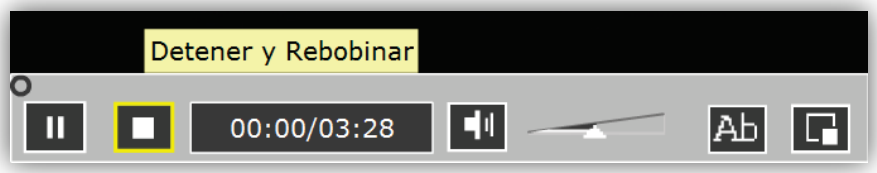
If the users can use a video player with keyboard, then they can track focus of the interface components. (See figure 7).

However, is not only necessary to track the focus also essential that users can predict which logical behavior of focus will be.

Therefore, focus of video player buttons must move as logical sequences no arbitrary jumps.

Finally, some buttons of video player can change of status (e.g., turn off or on the audio). To accomplish this feature, the ability to capture focus should be "inherited" for each of the buttons with change state property.

Figure 7. Tracking focus of Bankinter video player buttons.



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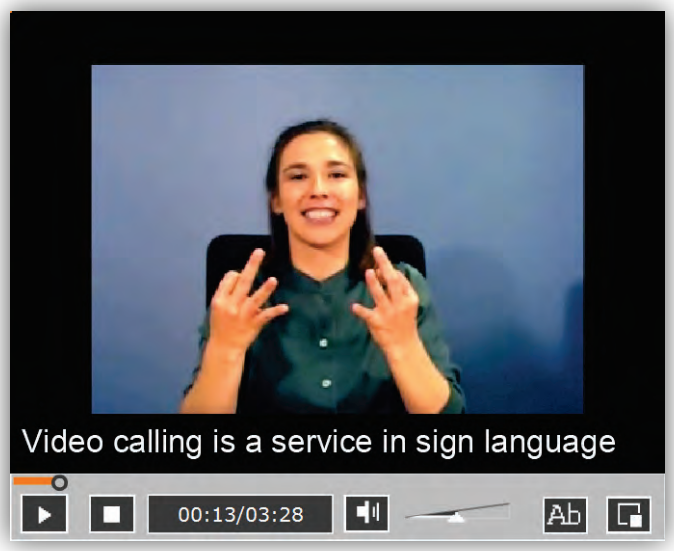
Inclusion of subtitles

It is obvious that video content must be accompanied by subtitles for hearing impaired users to be read by them (see Figure 8).

Figure 8. Presentation of subtitles in the video player Bankinter



But also, to create subtitles in the video content the video player should be based on existing standards of subtitling. It is the only way to avoid failures when we display video content through different Internet browsers (see Figure 9).

Figure 9. Definition of video content subtitles in Bankinter video player.

```
<?xml version="1.0" encoding="UTF-8"?>
        <tt xml:lang="en" xmlns="http://www.w3.org/2006/04/ttaf1"  xmlns:tts="http://www.w3.org/2006/04/ttaf1#styling">
                <head>
                        <styling>
                                <style id="emph" tts:fontStyle="italic" tts:fontWeight="bold"/>
                                <style id="quote" tts:fontStyle="italic"/>
                        </styling>
                </head>
                <body>
                        <div>
                                <p begin="00:00:10">Videollamada en Lengua de signos es un servicio de información financiera
                                <p begin="00:00:15">Resolvemos cualquier duda que pueda tener.</p>
                                <p begin="00:00:19">Nos comunicamos en lengua de signos o escribiendo por el chat.</p>
                                <p begin="00:00:47">Buenos días, soy Elena Madina</p>
                                <p begin="00:00:54">Buenos días, soy Cristina Fernández</p>
                                <p begin="00:01:03">Somos las responsables de Videollamada en Lengua de Signos</p>
```

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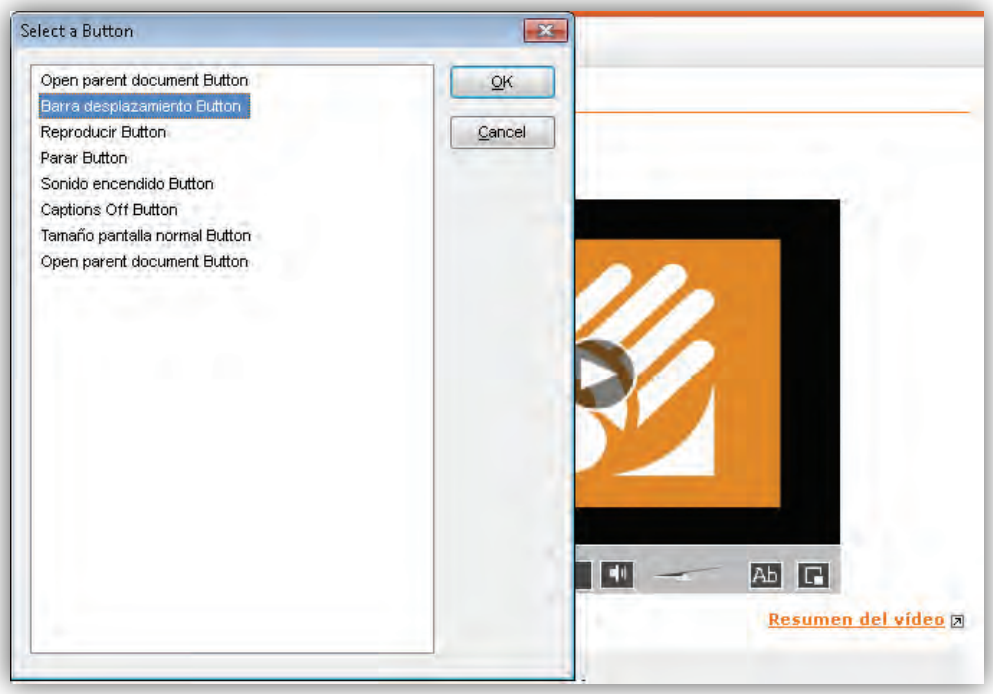
Turn on/off accessibility options

Many users with disabilities choose to access to the contents of web pages through adaptive technology, such as Zoom Text, Jaws, Windows Eyes, etc.

Ideally, the video players must be compatible with all adaptive technology, but several of these applications used by people with disability have not been developed based in common standards.

For this reason, an inherent property of video player must be to turn off accessibility features when there is adaptative technology together with video players.

Figure 10. Video player Bankinter running with screen readers (Jaws)



Maximize contrast and legibility

A very important feature that most market video players don't have is an appropriate visual contrast of their components.

A poor visual contrast affect to the population of users with low vision which have a useful visual rest.

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The absence of adequate levels of contrast or legibility [7], result in the inability of low vision users to locate the functions of the video players, for example they cannot discriminate which is the symbol of "play" inside buttons of video players.

In our case the graphic design of the video player of Bankinter, has adapted its appearance to a number of color combinations to obtain levels of contrast, and color differences recommended by the WAI standards, as shown in Figure 11 and 12.

Figure 11. Visual contrast valuation on video player buttons and surrounding areas.

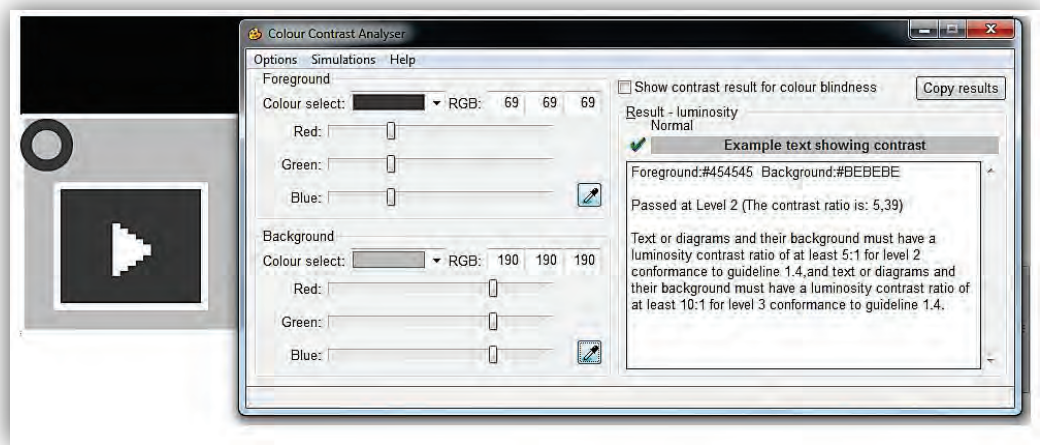
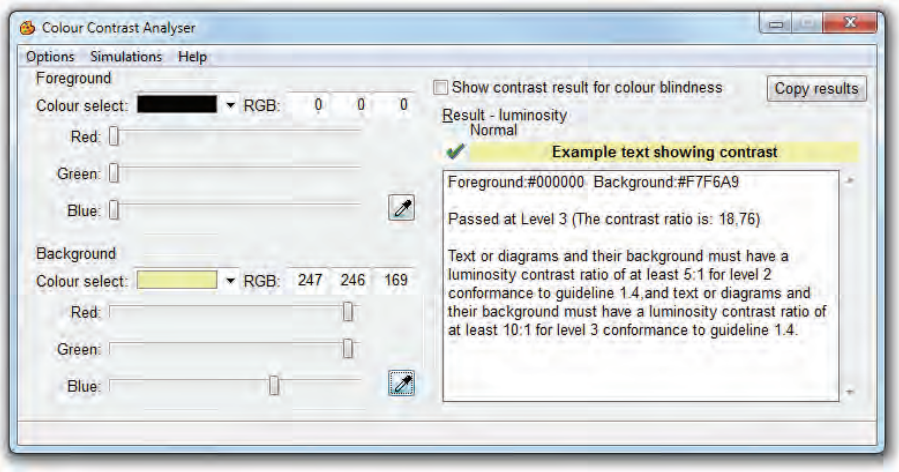


Figure 12. Visual contrast valuation on help text components of video player Bankinter.



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Conclusions and future work

The accessible video player of Bankinter has been published in January 2011. As a result of experience in the design and development thereof, we can draw some conclusions.

Firstly, the result of this experience is that benefits justify development investment.

As we have been showing throughout this work, the use of video content in Internet is not only a reality, but also involves a new way to communication way between customers and enterprises, included financial institutions.

The strongly demand of video online becomes a necessity to make video player accessible in the content and the way to present it.

The incorporation of the accessible video player of Bankinter offers new challenges related to the evolution itself.

We want to consider new video player functions such as accessible video galleries, RSS, TV channels, etc.

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