



**SEVENTH FRAMEWORK PROGRAMME**  
**ICT-1-1.5**  
**Networked Media**

*Specific Targeted Research Project*

**My eDirector 2012**

(FP7-215248)

**My eDirector 2012 - Real-Time Context-Aware and  
Personalized Media Streaming Environments for  
Large Scale Broadcasting Applications**

**[D7.5 System and Service Evaluation Report]**

Due date of deliverable: [31-04-2011]

Actual submission date: [13-05-2011]

Start date of project: 04-02-2008

Duration: 36 months

Summary of the document

<b>Code:</b>	<b>D7.5 System and Service Evaluation Report v1.8</b>
<b>Last modification:</b>	12/05/2011
<b>State:</b>	Final
<b>Participant Partner(s):</b>	ATOS, ICCS, AIT, BBC, INOV, QMUL, FBK
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<b>Fragment:</b>	No.
<b>Audience:</b>	<input checked="" type="checkbox"/> public <input type="checkbox"/> restricted <input type="checkbox"/> internal
<b>Abstract:</b>	<i>This document provides a comprehensive analysis of the findings describe on D7.3.</i>
<b>Keywords:</b>	<ul style="list-style-type: none"> <li>• <i>Trial</i></li> <li>• <i>Evaluation of the platform</i></li> <li>• <i>Future</i></li> <li>• <i>Functionality</i></li> <li>• <i>Exploitation</i></li> </ul>
<b>References:</b>	Related Documents (inside and outside the project) D2.5 Trials Architecture and Configuration D2.7 Business Model D7.3 Report on Field Trials, D7.4 Technology Evaluation Report, D8.2 Market Analysis, D8.3 Exploitation Plan

## Change history

Version number	Date	Changed by	Changes made
0.1	12/4/2011	Hannah Fraser	Initial Document with ToC generated with some structure, tables and text added to section 3
0.2	27/4/2011	Hannah Fraser	Added sections 2, 4.3, 4.5, 5.1. Additions to section 3.
0.3	4/5/2011	Hannah Fraser, A Pnevmatikakis	Additions to tables in section 3
0.4	5/5/2011	A. Pnevmatikakis	Additions to tables 1 and 3
0.5	9/5/2011	E. Garrido Lemonia Argiriou Ch. Patrikakis H Fraser	Input for 4.1, 4.2 and 4.4  Minor Changes
0.6	9/5/2011	H Fraser L Argiriou	Added content to section 3.2 from L Argiriou
0.7	10/5/2011	H Fraser	Added input for 5.3, Minor changes, additions, spelling throughout
0.8	10/5/2011	S. Poslad Z.Wang	Additions to Section 3
0.9	10/5/2011	H Fraser	Added sections 1.1 & 1.4 Removed most comments
0.10	11/5/2011	N. Escravana	Additions to Section 3
0.10	11/5/2011	David Salama	Change ToC, add new table structure so the document focused on the future as conclusions of D7.3, request final contributions.
1.0	12/5/2011	H Fraser	Added section 4 Merge multiple inconsistent documents (all ATOS v0.10 added)
1.1	12/5/2011	A. Gómez-Muriana	Incorporation of lost changes from 0.10. Removal of section 3.
1.2	12/5/2011	E. Garrido Paul Chippendale	Input of 3D and Metadata into section 5.2
1.3	15/5/2011	L.Argyriou, Ch.Patrikakis, N.Papaoulakis, Ch.Androulaki	Input in section 3 and section 5.2

Version number	Date	Changed by	Changes made
1.4	12/5/2011	H Fraser	Changes to section 1, section 5.2
1.5	12/5/2011	A. Gómez-Muriana, Diego Garrido	Changes to section 3 and 4.
1.6	13/5/2011	A Pnevmatikakis Emre Colakoglu	Addition to section 3 Quality Assurance
1.7	13/5/2011	H Fraser	Minor changes throughout. Additions to 5.2
1.8	13/5/2011	A. Gómez-Muriana	Minor modifications

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## **1 Executive Summary**

### **1.1 Scope**

The scope of this deliverable is to cover the development of the My eDirector system following on from deliverable 7.3 over the final year of the project. It also covers the potential scenarios of the system that could be applicable.

### **1.2 Audience**

This deliverable is public.

### **1.3 Summary**

This document includes broader conclusions that can be drawn from the field trials and the individual lab trials collectively. It also covers the potential of developing such a system.

### **1.4 Structure**

Section 1 gives the executive summary of the document.

Section 2 is the introductory section containing general information about the deliverable.

Section 3 then shows how the prototype system developed, changed and improved over the final year of the My eDirector 2012 project.

Section 4 discusses and reference documents that discuss how the My eDirector 2012 system has been tested and the conclusions of these tests. It also discussed how it may be exploited and the scenarios it could be deployed for.

Finally the potential future for the My eDirector 2012 system is explored.

## 2 Introduction

The evaluation activity of the project was initially discussed in D7.2. This evaluation has taken place in the 3<sup>rd</sup> year of the project and is described in D7.3 and this document.

My eDirector 2012 evaluation activity aims to evaluate the outcome of the research and development carried out mainly in the first two years of the project, and also in the third year of the project. The reason to proceed with these evaluation tasks is to gather information from the project's output in order to fine tune the platform, following the completion of RD activities and to prepare the project for the exploitation. The analysis of the evaluation will be done to provide evidence that will allow us to have a clear vision for the future.

### Fine tune the platform

- Add
  - Improve
  - Drop
- } functionality

### Prepare for exploitation

- Evaluate potential use
- Identify usage scenarios
- Test user acceptance
- Assess usefulness
- Compare to competition

### Future Vision

- Report on technologies
- Research agenda
- Link to other platforms

### 3 Fine tune the platform

In this section, the actions towards the enhancement of the platform, both taken during and after the project's results are reported. It should be noted that emphasis is given in the results that have emerged out of the evaluation during the live and field trials, while enhancements that can come out of the adoption of future research as mainly addressed in the section about Future Vision.

#### 3.1 Additional functionality analysis

This section includes a summary of new functionalities and features added to My eDirector 2012 platform during the 3<sup>rd</sup> year of the project as a conclusion of our internal assessment and what we understand would increase the value of the platform after the analysis of the trials formalized in D7.3.

##### 3.1.1 After internal evaluation

During the 3<sup>rd</sup> year of the project, the integrated system had more of its components integrated and the system became more mature. During this year as members of the consortium used the system, their feedbacks led to additional functionalities being implemented.

Functionality Name	Description	Reason added	Month added	Other comments / issues
Tool Prompt	A dialog box appears if the user has not used a function during the first 4 minutes of the trial asking, for example: "Have you trial using the Zoom Tool?"	To encourage users to discover unexplored functionality of the system		
Live profile adaptation	Full support of on-the-fly profile adaptation	To support profile adaptation of active users based on their past proposal acceptance	March 2010	
MPEG-7 messages	Visual annotations on tracks, IDs and detected incidents	To provide an enhanced visual experience	Throughout 2 <sup>nd</sup> semester of 2010	functionality existing but not integrated
Smart ROI estimation	The functionality for cropping around the estimated action.	To accommodate resolution-limited displays	Dec 2010	functionality existing but not integrated

Functionality Name	Description	Reason added	Month added	Other comments / issues
Integrated real time logging	Main system modules were extended to produce logging about system and user behavior and deliver that data to the SP/AAA module. A web tool was developed allowing every partner to access in real time the full integrated log data.	Troubleshooting was difficult and often involved exchange of information between several partners taking long time.	Dec 2010	
Integrated real time statistics	A web tool was developed allowing every partner to follow the field trials, making available statistics for system usage, problems, adoption, interaction, etc. This statistics are calculated through the log data in the SP/AAA and made available in a separate server.	To provide a way to follow up field trials evolution.	Feb 2011	
DVB User Profile Creation plugin	The user selects the new plugin in order to choose the order of the events that he is interested in and to change the username and password	To provide the user with the feasibility to choose between the events he is interested in and to change his username	Oct 2010	

**Table 1: Added Functionalities**

**3.1.2 Proposed functionality to be added**

After the trials analysis was carried out on D7.3, the following table shows a list of proposed functionality that can be added to My eDirector 2012 platform.

Functionality Name	Description	Justification
Cross-platform support.	Adapt the platform to enable users from alternative OS's, like Linux or Mac OS.	A small group of users are unable to use the platform because they are using different operating systems that the current platform is incompatible with.
Load balancing	To enable scalability for commercial use of the platform, a load balancing system for streaming servers should be integrated.	Current servers were enough for serving the load generated by field trials, but in a real-world scenario, more servers will be needed as for the use peaks, and the platform should manage the load among them.
Recommendations frequency	Enable the users to control the frequency of recommendations. Also, to investigate the best default value for this option.	Some users commented about getting less recommendations and others about getting too much, even repeated recommendations.
Recommendations labelling	Put labels describing the recommendation so that the user can understand why something is being recommended. Specifically, the users are able to distinguish angle recommendations and event recommendations.	People don't know when a recommendation was sent. Although the video stream was shown, people could not recognize it and identify as something interesting without a text label describing the recommendation.
Timetable / Schedule	Display a timetable of the events. This is a good place for the user to choose its preferences.	No information about events was given to the users, so they didn't know, for instance, how much time they need to wait for a specific event to start.
Alerting	Addition of an alerting system when a specific event is starting	Most of the time users didn't know if an interesting event was starting if it was not described in its profile.
Audio track switching	Enable the user to select the alternatives audio tracks for the viewing event.	Just one audio track with ambient sound was streamed for all the cameras, but the interviews. Users demanded professional commentaries.
Live sports data	Live sports information and stats on the screen.	Most people are unaware of who is on the screen.

Functionality Name	Description	Justification
Multi-event watching	Enable the user to watch more than one event on the screen at once. This could be implemented splitting the screen into an on-screen window like the recommendations.	Several people demanded this feature in the questionnaires.
Share to friends	Ability to share an event camera or shoot for a social network friend.	There are no social features currently on the platform.
Social like / dislike	Show a button to the user, so he can indicate if he likes an event, camera or shoot, with a total like counter.	There are no social features currently on the platform.
Recording	Ability to save the user chosen footage.	There are no recording features currently on the platform.
Virtual athletes	Display previous best marks in a form of virtual athletes on top of the video to compare with current athlete.	This is an extension of the “live sports data” functionality, which gives the users quick information about how well is performing one athlete at any moment.
Event finalization handling	Reacts when an event finalizes to show recommendations or an event list to the users.	Currently when an event is finalized it's not handled by the platform and a blank screen with a logo is shown. This led to user confusion.
Unified user interface on heterogeneous technologies.	Making use of the next generation TVs and STBs that combine digital video broadcasting technologies with internet access, personalised features could be offered through the use of cross-platform web applications (widgets) while maintaining the advantages of broadcasting.	Trend for next generation broadcast and internet services over a unique platform (i.e. web-enabled TVs)
Within event switches	Force the within event recommendations as camera switches, while keeping the between event recommendations as PiP to be accepted by the user.	This stems from the analysis of the user session data in section 6.13.1 of D7.3. The portion of within event proposals that remain viewed as PiP is increased due to the rapid switching.

**Table 2: Proposed Functionalities to Add**

### 3.2 Functionality Improved

#### 3.2.1 After internal evaluation

During the 3<sup>rd</sup> year of this project, members of the consortium used the system feedback that was given led to the improvement of much functionality.

Functionality Name	Description	Improvement	Reason Improved	Month of Improvement	Other comments / issues
Profile acquisition	This means new or adapted profiles are registered with the KB	Profile builder notifies on changes, instead of having the KB periodically polling	Simplified signalling and ensured timely updating	Oct 2010	
Clock synchronization	All computers running platform components have been synchronized to in an NTP server	Ensures fine synchronization	Manages the synchronization of the platform that is distributed across different countries	Nov 2010	
DVB synchronisation	Synchronisation of broadcasting video over internet & DVB and of metadata & recommendations display	Fine synchronization of video & metadata	Manages the synchronization of the broadcasting video and the metadata that are displayed	Nov 2010	
Steaming start time	Video Stream start times changed	More appropriate timing of video streams		March 2010	
Camera Switching	Allows user to switch the cameras themselves	Bitrates control so that small pip consumes less bandwidth	To improve the multi streams support in the system	Jan 2011	

Functionality Name	Description	Improvement	Reason Improved	Month of Improvement	Other comments / issues
Recommendation UI	Push the suggested video to users	Auto pop up window interface	Better notify the user recommendation	Dec 2010	
Rating and Comments UI	Collecting user feedback during trial	Usability	UI better self explained	Dec 2010	
User profile update	change of user preference of video content	Profile update page upgrade	To better integrate the player with registration page	Jan 2011	
Replay	A time-shift playback function	Limiting the buffering capacity	To adapt to the streaming buffering deployed in streaming server	Dec 2010	
Multi-stream display including Recommendation UI and camera switching UI	Allowing PIP in player main screen	Impose http requests control	HTTP request on live streams from streaming server cannot be effectively killed even when the pip player is disposed	Dec 2010	
Zoom	Interactive zooming on interested targets	usability	Usability can be confusion	Dec 2010	
Trial timer	Monitoring usage time and help synchronize with streaming server	Insert questionnaire activation time marker	Prevent immediate access to the post-trial questionnaire	Dec 2010	
DVB channel switch improvement	DVB had a function that switched the channel according to the recommendation	The function was replaced with a slower one	This function due to fast channel changes blanked the picture of the DVB	Nov 2010	

Functionality Name	Description	Improvement	Reason Improved	Month of Improvement	Other comments / issues
DVB Profile creation	DVB sends the profile preferences inside a SOAP message	Changed the string of letters and replaced it with a string of numbers with less than 10 characters length	DVB could not handle to send more than a 10 characters in one string	Nov 2010	

**Table 3: Functionalities Improved**

### 3.2.2 Proposed functionality to be improved

After the trials analysis was carried out in D7.3, the following table shows a list of proposed functionality that can be improved My eDirector 2012 platform.

Functionality Name	Description	Justification
System Login Page	Accept user credentials, allows paste of the password	No paste function in the past
Zoom usage	Improve the way the zoom button works to make easy to the user. For instance, using the same action for zoom in and out.	As users reflected, zoom was not very easy and it was difficult to exit the zoom mode. It got the lowest score by the users.
Zoom functionality	Follow the object selected by the user when zooming-in instead of stand on a fixed area of the screen.	When zooming, the object of interest for the users is usually lost, because it's changing the relative position on the screen.
Recommendations synchronization	Enhance the synchronization between the recommendations and the video.	Sometimes the recommendations arrived after the recommended functionality was used. Other times, events were recommended before the video started to show them, so a black screen was recommended for no apparent reason.
Replay time	Replay time was limited to 20 seconds because resource limitations. Longer replay times will make this feature more useful.	People demanded better replay functionality and longer replay times.

<b>Functionality Name</b>	<b>Description</b>	<b>Justification</b>
Content quality	Use High-Definition material with the platform. Some features, as zoom, are most useful when using HD content.	People demanded better video quality of stream/resolution. Even they have a good Internet connection, the quality was limited because the content used on trials was on standard 576i quality.
Smooth camera switchover	Improve the camera switching times, to match the quality switching ones. Keep a continuous sound.	Currently, camera switching needs about two seconds, which it's too much for camera angle switching, because the users could lose valuable parts of the event.
Player design	Improve design quality of the icons and intuitiveness of navigation.	There is enough room for improvement in this area to match current standards.
Enhanced personalisation in broadcasting services	Use of advanced device capabilities regarding user interaction for providing high level of personalisation over broadcasting services (i.e. pop-up video windows, combination of web in broadcasting technologies, use of next generation broadcast techniques such as hybrid broadband broadcast HbbTV).	Technology is becoming commercially available and new standards in digital broadcasting are appearing.

**Table 4: Proposed Functionality Improvements**

### 3.3 Functionality Dropped

#### 3.3.1 After internal evaluation

During the 3<sup>rd</sup> year of this project, members of the consortium in testing and using the system feedback given that led to functionalities being dropped.

Functionality Name	Description	Reason Dropped	Month of Improvement	Other comments / issues
Final questionnaire popup	At the end of the trial a pop-up window appears containing a link to the final questionnaire	Many users may have blocked pop-ups so this was not a relevant mechanism to enable users to complete the final questionnaire	Dec 2010	
Fast-forward, rewind in speed x2, x6	A traditional DVR function	The interface does not support live streams from ATOS	Jan 2011	
Pre-trial survey of player	A initial survey to collect user information	The interface is replaced by ATOS registration page	Dec 2010	
Network Stats Indicator	Indicating the current playback bitrates in second	Usability confusion and the data are collected via INOV logging service already	Dec 2010	
Post-trial questionnaire button at footer of the Web page	Direct user to the questionnaire page	Usability concern after stress test	Dec 2010	

**Table 5: Functionalities Dropped**

#### 3.3.2 Proposed functionalities to be dropped

After the trials analysis was carried out in D7.3, the following table shows a list of proposed functionality that can be dropped from My eDirector 2012 platform.

Functionality Name	Description	Justification
Pop-up notifications	The player showed some pop-ups Windows on top of the video that avoid a good viewing experience. Their messages can be shown in a less intrusive way.	Current usability standards recommended avoiding too intrusive windows if they are not strictly necessary.

**Table 6: Proposed Functionality to Drop**

## 4 Prepare for exploitation

### 4.1 Evaluate potential use of system

As the project's name indicates, the My eDirector 2012 platform had in mind the London 2012 Olympic Games. Only a limited number of Broadcasting Organisations are granted by the IOC (International Organization Committee) or LOCOG (London Organising Committee of the Olympic Games) to transmit the Olympic Games or Paralympic Games through television, internet or radio in a particular territory. The amount of RHB (Rights-Holding Broadcast Organisation) is quite small, but their potential clients cover the whole world. In D8.3, in section 3.2 a possible portfolio is being proposed to be used by OBS and be presented to the RHB.

### 4.2 Identify usage scenarios

My eDirector 2012 solution can be used for hundreds of events where several athletes are competing at the same time and a spectator might want to select the target organization he wants to watch such as any Formula 1 race, alpine skiing competitions, where several athletes may do the run at the same time, swimming competitions, basketball, ice hockey, athletics, etc.

There are other events that are also multi-sport events like the Olympic Games. Several sports take place at the same time and a user might be interested in watching a specific one, for example: Paralympic Games, Youth Olympic Games, Mediterranean Games, Panamerican Games, Commonwealth Games, Asian Games, All-Africa Games, Universiade or Jeux de la Francophonie.

Especially for the cases of sports where action is taking place in parallel, such as Formula 1 racing, the viewers may be interested in viewing drivers that may not be in the first positions (because they are fans of the specific driver or racing team, or because the driver may be involved in a critical situation such as over taking, or even due to the interest because of the points that are involved in the position that he is after with respect to the world championship points he has collected). My eDirector 2012 could provide an excellent platform for this case that could personalise the viewing experience.

In D8.3 in section 4 another scenario is proposed: Football. This scenario is very appealing, as the unpredictability of the sport is high and in a seamlessly uninteresting match, a goal or an important action such as a penalty could happen at every time. Since in several occasions, matches are taking place in parallel, the My eDirector 2012 platform could allow fans to enjoy in live the action of more than one match, having the option to switch between them based on profiles and match description, while they could select to watch the most important in terms of action and switch to the others for any important action.

Finally, the case of world events with many participants, in which there is a participation of athletes with little chances of winning, coming from countries or teams with little tradition (i.e. Olympic Games), can also be considered a good candidate for usage scenario: Through the use of My eDirector 2012, the fans of the particular athletes could enjoy the action in the events that take place in parallel, while they could be automatically informed or redirected to the camera that shows their particular athlete, without

the need of constantly be on alert in order not to miss the action. Furthermore, as the attempts of the particular athlete may not be of great interest to the vast majority of viewers, coverage of these attempts could be over the internet, sent automatically to the interested viewers, without involving the director of the traditional broadcast.

### **4.3 Test user acceptance**

As part of the online field trials the participants had to complete a final questionnaire that was designed to capture much feedback including the participant's acceptance of the system.

The results of these questionnaires are fully described and conclusions are drawn in deliverable D7.3.

### **4.4 Assess usefulness**

To use of My eDirector 2012 for any event development and personalization task has to be done. The My eDirector 2012 platform is a small system to prove and exploit the research done in My eDirector 2012. The image processing algorithms are developed to recognize athletes running or when they're going to jump. It is a small subset of sports compared to those available in the Olympic Games. The solution has to be improved in order to cover all the sports available in London. Also, to use it with a RHB in an Olympic Games we will have to take into account the possible translation from text is required and that each broadcaster might like to have another look and feel and a different way to present the menus from the player. Also, from the experience in real projects, broadcaster works with a specific content delivery network (CDN) and would like to have integration with social networks (Facebook, Twitter) and they would like to have widgets to show medals result, records and other information about the Olympic Games.

The use of further audio sources (commentators' audio) would greatly enrich the My eDirector 2012 system and should be implemented in a real solution.

### **4.5 Compare to competition**

The comparison of the My eDirector 2012 system with other industry options is explored in the deliverable D8.2. This deliverable, D8.2, covers the systems available on the market and used by industry. Trends are also explored in deliverable, D8.3

## **5 Future Vision**

### **5.1 Report on technologies**

The technologies that have been selected and used are discussed in deliverables D7.4 and D8.2. Alternatives that were not selected are also discussed in these deliverables.

There are many areas of research that could be carried out in the future. Many of these are described below:

- **Integration with latest HMI devices to maximize usability and user comfort.**

The latest developments in the use of state of the art sensor technology including light, sound motion and even scene and face recognition, have paved the way for supporting enhanced user interaction. Through the integration of the corresponding sensor devices to the end user applications and terminals, the platform could make use of sophisticated user status identification such as mood detection, gesture recognition and position recognition.

Technically, this could be offered through the use of the latest HMI devices, like time-of-flight cameras, (Microsoft's Kinect is an excellent example here). Through this enhancement, the metadata and recommendations provided to the user could be offered based on interpretation of his feeling expressions captured by the camera and processed by the corresponding software. As a result, fine tuning of the personalisation process could be offered based on the actual situation as this is identified by the number of persons that watch the event, their IDs (here, special care should be given to privacy issues) and their emotional status

Another use of state of the art HMI devices is that of enhancing the usability of the platform, especially for devices such as Set Top Boxes (STBs) and TVs, where the user could use simply gesture for interacting with the platform and change the channel, zoom etc. That makes the system really easy and comfortable in navigating and using.

- **3D-content analysis and transmission to final users:**

3D tracking results (D3.7) have illustrated the potential of passively following the progress of athletes in sports events. Information about individual's pace, position, etc. can be delivered to the user to help provide interesting performance statistics as well as provide better 'best shot' coverage. Currently, 3D passive vision tracking required a dense coverage of calibrated cameras (which is often the case at large sporting event anyway), but in the future as 3D cameras start to capture the action on a more regular basis, especially at high profile events, a much greater precision could be obtained from fewer cameras opening up a host of opportunities ranging from synthetic viewpoint generation to fine-grained performance stats.

- **Adaptation e integration with user generated content.**

The growth of video services on the Internet has made available a huge amount of videos, some of them being uploaded only few minutes after recording. Here, the recommender should have to incorporate into its output, these videos generated by the users.

More specifically, it will be necessary to search videos on the Internet related to the broadcasted event, and analyse them to generate enough metadata so the recommender can match them with the profiles of the users. This also involves the management of UGC database with all the metadata generated.

- **Use of social networks to generate or enhance recommendations.**

Another advantage could come out of the use of the power of social networking that could assist even further in the personalisation of the coverage of the event. Here, the profiles of the users could be used in order to group them into clusters of similar profiles. For each group, a virtual profile corresponding to an average or characteristic user can be extracted, based on the use of the appropriate clustering method. A separate channel could be set up for each profile, following different coverage of the event in terms of selected camera, statistics and commentary.

The selection of the number of different groups could be based on the availability of resources, while the formation of the virtual profiles can be based on the maximization of interests' commonalities between users. Moreover, the recommendations coming from the annotation (in real time) of the broadcasted content, combined with the virtual profiles for each group can be combined in order to select the most appropriate camera and accompanying information (i.e. statistics) to be streamed to the users belonging in each profile group.

- **Auto-generation of user profiles based on friend profiles and geolocation.**

The easiest and simplest way to collect information is through an explicit method, based on the use of forms or specific interfaces is a very effective method to collect information focused on a particular area, it cannot provide accurate information in a diverse environment. For example, in the case of football, a form for collecting the user's preferences regarding teams he/she likes, favourite players, and important events in a match is very useful in order to create an accurate user profile. On the other hand, large athletic events such as Olympic Games including a high number of sports though can benefit from an explicit method for creating a user profile as regards particular sports; but cannot generate a "universal profile" that can characterize the user across the Olympic events.

For this purpose, the use of implicit methods based on the exploitation of user activity records on browsing history, browsing activity, searching is valuable for creating a user profile with minimum user interaction that can also account for a variety of events and activities. Taking advantage of the personalized behavior of users in the use of social networking applications and also the ability for user geolocation; the use of history of the former and links together with the latter can help building a user profile easily and quite accurately, even for cases or issues that the user has not provided information. The successful example of social networking

applications as regards to recommendations for friends and activities strongly supports the first point. Regarding the second, since the ethnicity of athletes may influence the preference of users for a particular coverage, geolocation can also help in this direction.

As a conclusion, incorporating the ability to make use of social networking profiles and of information about the user status regarding geolocation would help the fast and easy creation of user profiles without the need for explicit input. This will prove valuable for the fast deployment of the service and also for the easier introduction to particular devices such as mobile phones and TVs and STBs.

- **Support of latest smartphones, pads and set-top-boxes with roaming profiles.**

Web browsing has been done almost exclusively using personal computers. With the technological enhancements that have taken place on smart phones during the last years, people are using it to browse on Internet anywhere. These improvements are being integrated also on all kinds of devices, likes electronic pads, set-top-boxes for TV decoding, games consoles, etc.

Current WebTV implementation has been focused on traditional computers, from the interface layout to the platform processing requirements. The challenge to adapt the platform to these new devices involves things like creating new ways of collecting user preferences, interface redesigning, and support of low-profile devices or optimization on power consumption.

Moreover, enabling ubiquitous access to My eDirector 2012 through these new devices and heterogeneous infrastructures generates the need of accessing the platform using the same profile on different devices and to keep analysing the user behaviour even when the user is connected concurrently on several devices.

- **Ability to generate new points of view from current cameras and calibration data.**

The creation of new cameras angles synthetically from a defined set of cameras covering the same venue, it's feasible with current state-of-the-art technologies, as it's pointed in "3D-content analysis and transmission". Providing these additional cameras, the users' experience will be enhanced. Moreover, the system could be capable to generate stereoscopic content from simple cameras or for using on glassesless 3D TV sets.

- **Targeted marketing option for revenue generation the system.**

Targeted marketing uses the information collected about individuals browsing behaviour to select which ads to show to that individual. This system allows online display of advertising to users who are more likely to be influenced by it. The targeted marketing includes therefore all approaches that use existing information about past behaviour of the individual to get defined and classified, in order to target advertising more appropriate to each audience. Incorporating this advantage to My eDirector 2012 platform could be an extra value that will allow, for instance, to use the information extracted from the users' watching preferences for offering them personalised adds. These advertisements will be related to their favourite sport, their favourite team, items with the brand worn by their favourite team, tickets for events sponsored by a representative athlete or player, etc... This change will mark significant advantages for both advertisers and media.

- **Metadata**

The My eDirector 2012 has huge amount of metadata available. There is much more that can be done with this metadata. As commented in the "3D-content analysis and transmission to final users" section, information about individual's pace, position, etc. can be delivered to the user to help provide interesting performance statistics. A whole study of how to present this statistics can be done: it can be researched on how to present the statistics and which data present. Personalization on metadata can be researched in future projects: different data can be presented depending on the user's profile (professional/ non professional user, subscribed/free user, etc.). With image processing algorithms, a portion of the screen might be detected where relevant activity is taking place and stream this information as metadata. Also automatic zoom and other functionalities can be added, such as to show adverts where there is low activity on screen. Other fields to explore are finding a solution to enhance searches using the available

metadata and ways to reduce the space occupied by metadata.

- **P2P Networking**

Following the concept and architecture of My eDirector 2012, the ideas and functionalities offered by the platform could be extended in an architecture that would be capable of providing interactivity, personalisation and efficiency through the use of P2P networks. This would be particularly interesting for the coverage of multi-camera, multi-event broadcasts on a world wide range, such as Olympic Games in an efficient and cost effective manner.

More specifically, the coverage of the event could be supported in a cost efficient way, using P2P technologies, thus eliminating the need for reserving excessive bandwidth. Taking into account that interest to the particular event is higher in particular geographic areas (countries of the contestants and places with large national communities from the two countries), a P2P distribution could also benefit from this, while bandwidth consumption from the origin of the transmission to these countries could be minimised.

## 5.2 Link to other platforms

As traditional television viewing is changing and embracing many other technologies and platforms the My eDirector 2012 system would be strongest linked with as many TV programme mechanisms as possible. For example many channels have an on-demand service that is delivered via the internet. In the UK traditional terrestrial channels BBC1, BB2, ITV and channel 4 all have on-demand services of some of their programmes.

These on-demand services could well be linked to the My eDirector 2012 system. With archived programmes being available relevant content can be offered via My eDirector 2012. Further to linking to traditional TV coverage the system should also link to social networking sites (e.g. Facebook, Twitter, Bebo, Friends Reunited) Athletes/celebrities' Blogs, websites or Wikis and related computer games.

Current set top boxes (STB) have the potential to perform some of the My eDirector 2012 functionality but future generation STBs will be able to handle all the My eDirector 2012 functionality. These 2 together could make for a very powerful service. The next generation of STBs, such as YouView<sup>1</sup>, are ip enabled making it possible to have the full potential functionality of the My eDirector 2012 system AND view the content on the most favoured device, TV, to view large events on. This is all possible without potential viewers needing to purchase dedicated hardware.

The potential to link to other services is almost endless. The success of this linking is likely to be determined by the quality and success of negotiations with the 3rd parties rather than the technical side.

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<sup>1</sup> "YouView has been specially created to allow developers to create apps for the TV. Plus, content providers can add their programmes to the guide. So there's no limit to what your TV could become." Reference: [www.youview.com](http://www.youview.com)