

From Coach Potatoes to TV Prosumers: Community-Oriented Content Creation for IDTV

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Abstract. The transition from mere content consumers to more proactive “prosumers” that transformed the web is finding now place in the context of idtv. In the close future it will be common that TV content will be empowered with interactive applications that will be created not only by professionals but also on the final users’ side. This fact will change the traditional role and stereotype of TV users from “coach-potatoes” to active generators of content. This paper presents a step forward to this vision through the development of a content creation tool for enabling local communities to create and share idtv content. The paper presents the tool development process as a user-centered approach and its evaluation in a real context.

Keywords: idtv, content creation, prosumers, content management system.

1 Introduction

In the latest years there has been a major transformation in the way users consume and generate media content. In fact, it is clear that the new trend for users is to increase their participation in the development and share of content through online communities. This shift on users’ involvement in media lifecycle has redefined their role of mere consumers of media to become “prosumers” [1]. In the present, this trend is evolving from the web domain to other spheres such as the mobile web [2] and more recently to other platforms such as the interactive digital television (idtv) [3]. In particular in this latest platform, the involvement of users has started to comprise the different stages of the production-consumption lifecycle in a similar way as happened some years ago within the web domain [4]. It is now an emerging reality, the possibility of creating virtual idtv communities dedicated to social networking [4][5]. In particular, the community-level dimension of idtv has a significant peculiarity when compared to traditional online web communities. An example of this is the coverage area of idtv that is limited to well define geographic areas making possible to cluster communities together with specific local content of interest. In other words, the communities built around idtv are intrinsically connected to particular territories and can be naturally associated to specific local services. This fact is particularly beneficial to specific communities and territories affected with low accessibility to the Internet (such as rural areas in developing countries), where idtv presents a good potential for providing interactive services focusing the local needs. Moreover, based

on the strong penetration and ubiquity of TV in our society its use as a mean for social inclusion is a powerful concept that requires further exploration [6]. For example, the use of idtv in marginalized areas or addressing digital inclusion needs of certain sectors of the population (like elders) is of paramount interest [7][8].

This paper presents a content creation tool for enabling local communities to create and share idtv content. In order to provide good accessibility to the tool that is targeted to users with limited knowledge of technology, different studies were performed. The results of the studies obtained during both, the requirement definition of the tool and the evaluation of its use are presented. These studies were of relevance from two different viewpoints: 1) as a tool for adequate identification of requirements for this specific work and 2) given the early stage of idtv in Latin America, as a preliminary, more general overview of requirements setting for the development of idtv in such region. The following sections describe both, the main characteristics and components of the content management system tool based on a user centric approach and the results of its evaluation.

2 User Centric Content Creation System

The community-oriented Content Management System (CMS) presented in this paper was elaborated within the framework of EU-SAMBA project [9]. In this project, the objective was to provide rural communities with means for creating and consuming relevant content, mostly impacting on digital inclusion for the target region in a sustainable way. In this context, a set of local institutions supporting the community as reference partners for improving societal inclusion and development were identified and involved. These institutions contributed as “Secondary Users” of the system, so those in charge of creating and sharing the community-oriented content with the rest of the population (Primary Users).

The CMS was designed following a user-centric approach by involving Secondary Users together with HCI experts. The analysis conducted by the experts was done based on information available on the Internet and documents existing at the local organizations (such as reports on educational levels, local economy and census, etc.) as well as from information gathered from users living or working in the town center. Some relevant requirements identified from the understanding of secondary and primary users experiences were related to the Content Management System (CMS) module and the data presentation and interactive services templates. In particular, several relevant functional features were identified related to Content Creation and Personalization as well as other non-functional aspects:

- Content Creation – The main requirements for content creation included the availability of content preview in the way the end user would see it, automatic tools for text verification (e.g. spell checker), manipulation of images within the CMS, creation of content reuse features (asset repositories, templates, galleries, etc.)
- Personalization – referred to the definition of different ways to deliver contents to primary users related to its format, language, and grouping. Examples of this are the existence of web templates, availability of multilingual content, visual themes, etc.

- Non-functional requirements – The main non-functional requirements identified together with Secondary Users included the system capacities (e.g. computer speed, operating systems, access to the web, etc.) and usability (focus on reusability and accessibility).

3 Content Management System

3.1 CMS in SAMBA System

The CMS in SAMBA project is part of the Platform Domain of the overall idtv system. A detailed description of the platform domain is presented in [10]. In particular, the CMS is responsible for the creation and management of the content and it is to provide the Web-database in which user data and content metadata are generated and stored. The CMS allows availability of information either through the Digital TV broadcasting channel or through a generic client to access to it through a simple HTML connection. To allow this, some preliminary operations are required in order to properly present these contents in a format suitable for the TV screen. In particular, the CMS communicates with the Playout Centre and provides it with a specific package consisting of the broadcasted application and the associated content.

The CMS in SAMBA generates DVB-J based applications which contain all the JAVA .class files referring to the different specific scenarios scheduled by the application itself. In addition, a XML file is needed in order to describe the broadcasting modalities of transmission of the application (see figure 1). This couple of files is transferred to the Playout Centre at specific pre-defined (and optionally periodic) instants. In this way, it is possible to refresh the contents of the application continuously in the time, satisfying the intrinsic constraint to have dynamic applications which can bring different kind of information (that is, text and photos) that can change with time. In fact, the Secondary Users have the possibility to insert/remove contents in/from the CMS at any time, and these modifications have to be visible to the Primary Users.

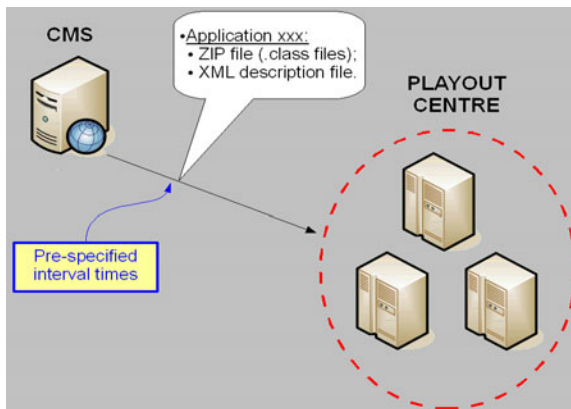


Fig. 1. Transmission of the applications from CMS to Playout Centre

3.2 CMS Functionalities

The CMS includes a set of pre-defined templates for simplifying the process of content creation (see figure 2). Indeed the motivation of a template-oriented approach was due to improvement of accessibility, reusability and personalization of the user interfaces.

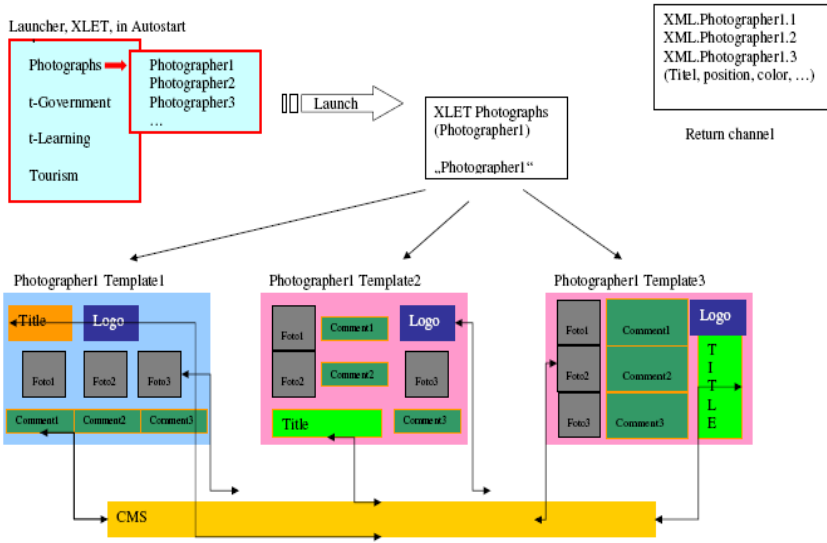


Fig. 2. Template-based interface design in CMS

These templates provide a set of different functionalities for creating different types of interactive content. The main functions of the templates include:

- **T-INFO** – Enabling secondary users to create info pages based on text and images.
- **F-ALERT** - The F-Alert is a functionality of the T-INFO application which has the objective to provide the primary users with means for creating alert messages
- **F-RANGE** - The F-RANGE functionality is composed by two different features: dynamic pages feature and rating feature for allowing respectively the display in a dynamic way of list of pages that can be reached through a specific T-INFO page and the number of clicks (of the single user of the entire community) related to a specific T-INFO page for ranking purposes.
- **T-PHOTO** – Used for creation of photo galleries with photo descriptions for exchange/commenting within a group of users.
- **T-VOTE** – Enable the creation of voting interfaces

- **T-SMS** – This application allows the primary users to send text messages (SMS) to mobile phones.
- **T-RSS** – To allow primary users to access through the DTV channel different kinds of content provided by several RSS feeds.

4 Community Content Production

The Community content production process involved three main steps; the CMS training process, the actual production of content and finally the system validation and usability tests.

4.1 CMS Training Process

In order to verify the system functionalities and usability, a set of tests were carried out. The objective of the tests was to utilize the system in a realistic scenario involving secondary users representative of a real community with digital inclusion needs. The community that was selected corresponded to the rural town of Barreirinhas in the North-East in Brazil. In this town three different institutions that were identified as potential Secondary Users were recruited:

- **SEBRAE** – That is national-wide agency supporting development for small-medium enterprises and community-oriented services in Brazil with a representation in Barreirinhas
- **Secretary of Education** – That is a government dependency responsible of education services
- **TV-MIRANTE** – That is a local TV broadcaster

A detailed training session was given to secondary users about the CMS functionalities and content creation. During this training the following techniques were applied: i) Workshop; ii) Direct Observations of CMS use; iii) Questionnaires. The aim was to validate the usability of CMS system by empowering secondary users to create interactive applications. Four secondary users (one man and three women) participated during the training for three full workdays. The artifact used during the training was a help manual, with a step-by-step description of the CMS with the objective to help the secondary users in the content creation process. The training involved usability experts and one of the system developers.

4.2 Content Creation

The CMS can work in both, a local or a remote server accessible through the internet that allows secondary users to create their own content and to reuse other existing one through RSS feeds. During the training sessions, the recruited users were assigned the task of creating specific content of their interest. Then using the combination of CMS functionalities, the templates allowed the creation of idtv pages and the association among them by forming a navigational structure. Figure 3 illustrates in its left side an example of selected content, and on the right its visualization through the T-INFO application.



Fig. 3. Preview option of CMS for the T-INFO application

Table 1 summarizes the content and test services that were created:

Table 1. Contents created during secondary users training

CREATED PAGES	SERVICES
- Nutrition (cashew, fruit of the cashew)	Business
- Free educational courses	Education
- Fashion	Business
- Tourism	Tourism
- Crafts	Business
- Poll on SEBRAE courses	Education
- Alert on business opportunities	Business
- Alert on dissemination of business results	Business
- Noise pollution	Education
- Pro-Literacy in Barreirinhas	Education
- Information about specific local tours	Tourism
- Generic business information	Business

4.3 System Validation and Usability Tests

The results of evaluation of CMS with secondary users provided in general positive insight about the use of the system. SAMBA CMS system was perceived by users as a very relevant tool for supporting the local community. Such affirmation is related to the intrinsic limitations of the town related to access to digital services or other forms of interactive information sharing, few secondary schools, and few options of entertainment offered to the community. In addition their answers in the questionnaire advocate the fact the primary users would access local content rather than access to a nationally produced content. The summary of the results on the validation process and the usability inspections is presented in Table 2. After the validation and verification process, some useful suggestions improved the iTV applications before the final usability tests with target primary users.

Table 2. Evaluation Results

Validation and Verification activities	Description
General Descriptions	
Verification tests	Ad hoc verification in group and Heuristic evaluation
System validated in real context	CMS applications, T-Info and T-Photo Gallery
Methodology Used for the Validation	
Secondary Users	5 users of 3 local organizations
Activities	Creation of content, reuse of content and visualization of created content
Artifacts used	CMS tutorial, questionnaires, diary and consent forms
contextualization with users	Invitation by correspondence and by personal contact as well as via telephone, five meetings with gifts, snacks and certificates
usability tests	During three days, team at least of three (designer, evaluator and psychologist) and one technician. They observed the execution of the activities and applied the questionnaires.
Created Content	
Type of Content	Education, Business, Tourism , News
Main Results	
Users´ acceptance and utility of CMS applications	Users show interest in producing content for all types of people including the desire to reach users from more far away houses. They were very positive about the access of users to the local content.
Usability of CMS applications	Despite reporting an average degree of difficulty, users were able to create their contents using the applications and the CMS manual with occasional requests of assistance of the evaluators´ team. Main problem: low internet access
Users´ acceptance and utility of idtv applications	Most users had positive experiences when using the applications. "I liked more the application of text. Because as a teacher I am part of that context." They were involved by the content and by the possibility of seeing what they refer as a "possibility" becoming "real". The utility for tackling digital divide was perceived by most users, according to the fact that TV is the most common communication mean in the city.
Usability of idtv Applications	Some difficulties appeared in function of the lack of familiarity with technology, legibility (in some TV screens, the applications were cut or had a black line) and the buttons on the remote control were in English. Suggestions were mainly related to have dynamic information.

5 Concluding Remarks and Future Work

The CMS proposed in this work is provided in the framework of the changing context of users' role from content consumers to prosumers. This phenomenon that was originated in the web domain is starting to migrate and impact in other digital domains such as idtv. . In fact, the main contribution of this paper is to present a content creation system for community-oriented idtv as a step forward to the vision of more proactiveness in the users side. The CMS tool presented here was tested and evaluated following a user-centric approach in a realistic environment for addressing digital inclusiveness in a small town in the Brazilian North-East. The ultimate outreach of this vision of users' involvement in the content creation process will change the traditional role and stereotype of users from TV "coach-potatoes" to active actors in the context of emerging idtv markets.

Regarding future work, the authors are aware of the need to extend this work towards the creation of relevant services based on the use of the CMS according to local opportunities and users needs. In fact, the users' field studies approach presented here was used for the requirement definition of the tool and the evaluation of its use. Current work includes the investigation of how primary user attitudes could be transformed into new opportunities for the business and how these businesses can be implemented in a sustainable way.

Acknowledgements

The authors would like to thank Raju Vaidya and Marilia Mendes for their valuable contribution to the development of the CMS and the usability tests respectively.

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