Values, Youngsters, and the Future Web

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ABSTRACT
This paper looks at the web as a value-promoter for youngsters - a means to instill "positive" principles, feelings, and attitudes in young people, at individual and social level.
We discuss through a number of examples how this view can be achieved today with the current web technology. We also propose that the development of methodologies that support the design of value-centered web experiences for youngsters, and of technologies that are appropriate for communicating and detecting value-related aspects, can be a major direction of work for the architects of the future web.

Categories and Subject Descriptors
H5.4 [Hypertext/Hypermedia]; H.1.0 [Information Systems]: models and principles – general.

General Terms
Human Factors.

Keywords
Future web, value, persuasion, youngster, social interaction.

1. INTRODUCTION
In today's schools, homes, and public spaces, young people are becoming frequent and experienced users of web technologies, which are shaping the way they live, play, learn, and interact with peers. At the individual level and, more and more, at the social level, most youngsters today live in both worlds: the physical world and the virtual world that the web makes accessible "anytime, anywhere" through multiple devices.

As this trend continues, it is increasingly important to explore both the needs of youngsters as web users and the characteristics of web technology solutions for this specific target, understanding both the *negative* and the *positive* effects of web use in young people.

The goal of this paper is to investigate the above issues and to discuss the positive opportunities in the "ethical" sphere that a youngster-centered view raises for the web. Our approach is *value-driven* since we regard the web for this target as a *value promoter* - a means to instill in young people "positive" principles, feelings, and attitudes at individual and social levels.

We discuss through a number of examples how this view of the web can be achieved today, with the current technology. We also propose that the development of *methodologies* that support the design of value-centered web experiences for *youngsters*, and of *technologies* that are appropriate for communicating and detecting value-related aspects, can be a major direction of work for the architects of the future web.

The rest of this paper is organized as follows. In section 2 we motivate our approach. In section 3 we provide an overview of projects carried on at our lab, where we have implemented the vision of the web as a value promoter. In section 4 we frame our approach in the context of the current state of the art. In section 5 we draw some conclusions.

2. RATIONALE
The web has already made its transition from an information distribution channel and a service provider to a socialization and persuasion medium. It supports an extreme "democratization" of user-generated content (think of YouTube), a means of sharing experiences, of "doing things together" (as in MMORPGs - Massive Multiuser Online Role-Play Games), or of "feeling part of a community". It provides means for commercial and non commercial "entities" to persuade, to reach the global society and to establish or promote their "brand" in the global economy.

In these forms, the web can induce a number of potential benefits for young generations, but it may also have (systemic) drawbacks.

Many studies have widely investigated the "dark side" of the web, i.e., the negative consequences of web use (and abuse) on youngsters, in both the physical sphere and the psychological sphere (e.g. compulsive behavior, addiction[1]) [19][25][27][28]. The contents to which youngsters are exposed or the activities in which they are involved on the web can transmit negative values and attitudes, or induce negative behaviors (e.g., think of the web use made by terrorists).

Even in situations in which "negative persuasion" is not the goal of the web designers, not all young people are able to critically filter and interpret the phenomena they are exposed to, benefiting from their virtual activities, and positively integrating their virtual experience with their everyday experience. This is particularly true for less educated young people, or youngsters who come from developing regions or live in marginalized geographical or social contexts. In this respect, a new form of digital divide is arising among young generations, which does not result from having no or limited access to ICT technology, but is produced by "remaining only a user" v.s. "becoming a critical actor" who can exploit the virtual experience in order to "grow"

[1] About two-thirds (62.1%, N=2328) of surveyed players of the massive multiplayer online game EverQuest, for example, would consider themselves addicted to the game [28].

as an individual and as a social animal, increasing his or her cultural, social and even economic capital.

How can the web – today and in the future – promote this critical attitude, reduce this form of digital divide, and instill key positive values into young people? The rest of this paper discusses a few projects in which we propose some answers to these questions using today's technology: multiuser 3D worlds and collaborative storytelling.

These projects have involved so far over 14.000 students from three different continents, and have given us the opportunity to empirically investigate the value-communication impact on a wide statistical basis.

3. OUR EXPERIENCE

3.1 Values through 3D Shared Virtual Worlds

The Hypermedia Open Center (HOC) of Politecnico di Milano has been working for several years on collaborative 3D virtual environments supporting educational experiences for young users.

All these projects – developed with various partners – share as a common goal the promotion of values such as: improved attitudes towards people from different countries and backgrounds, respect and curiosity for them, reciprocal trust and accountability, and increased interest for the subject matter of the experience and its institutional context (mainly schools).

The design aspects common to all HOC 3D-based experiences for promoting the aforesaid values include: synchronous online sessions with students from 4 different geographical locations, cultural discussions based on quiz questions about materials that students read in the intervals between online meetings, team games, and research assignments that students have to do in collaboration with remote team partners.

Social interaction with remote partners through gaming and competition generates fun, engagement, and challenges, and provides the motivation to study and learn new contents (which are functional to the competition and to the goals of the different activities). Connection with remote peers (e.g., through chat, email and forums) and collaborative synchronous and asynchronous activities encourage the development of mutual trust and accountability.

Social interaction through time (students meet remote peers in the 3D world for 3 or 4 times in about 6 weeks, and interact asynchronously on online forums) helps creating bounds that serve as a basis for collaboration, cross-cultural exchange, and for improving attitudes, curiosity and respect towards different cultures.

Figure 1 shows the typical workflow of activities of an experience in our 3D shared worlds. Online activities (interaction in 3D shared environments, e-mail and forum exchanges) alternate with more "traditional" offline activities (e.g., study of printed material), thus blending different modes of developing knowledge and skills and promoting values.

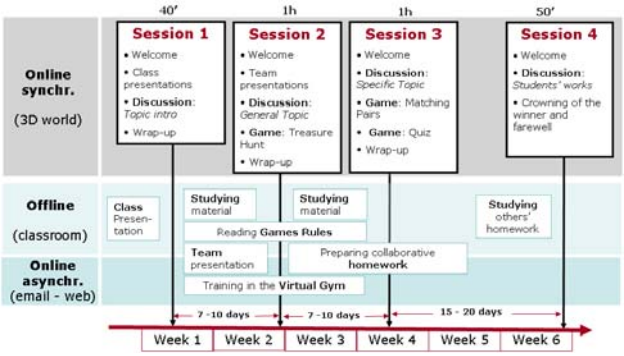

Fig. 1 The typical storyboard of edutainment activities in our 3D virtual spaces.

In addition to the values of interest, motivation, collaboration and mutual respect, each project seeks to convey specific values in terms of *attitude change*, as discussed below.

3.1.1 SEE – Shrine Educational Experience

SEE – Shrine Educational Experience is a virtual adventure about the Dead Sea Scrolls, developed for the Israel Museum of Jerusalem and targeted at middle and high school students from virtually every part of the world [11].

Students from different countries meet in a 3D environment resembling the Shrine of the Book, the wing of the Israel Museum where the Scrolls are preserved (fig. 2), and engage in discussions, games and collaborative activities about the Dead Sea Scrolls and the Qumran community who wrote them. Specifically, the experience promotes interest in and respect for a 2-thousand-year-old culture that lies at the roots of Western civilization; as young participants research and discover similarities between the Qumran community and aspects of their present culture, they realize to have more in common with peers from different cultures than they initially thought.

Attitude-change is measured through surveys to teachers and students at the end of the experience, and is often apparent in their interactions via chat and in the research works they present in the final online meeting. When asked whether they would be willing to repeat the experience, most of the students (90%) declared themselves either keen or very willing to (only 1% of respondents, in year 2004, said they would not). Interestingly enough, when asked to explain the reason why they would repeat the experience, they rated the possibility of meeting foreign peers to discuss with them far higher than the fun of the games and of the program.

As also observers in schools reported, the most appreciated session turned out to be the last one, during which every group was required to present to the others a research and to discuss it, thus comparing different cultural points of view. Benefits apparently lasted far beyond the end of the experience: an Italian teacher told us that after taking part in the SEE experience, later in the school year, she had brought her class to visit a synagogue; children were so specific in their questions and showed such a command of the subject matter that the rabbi thought they were Hebrew!

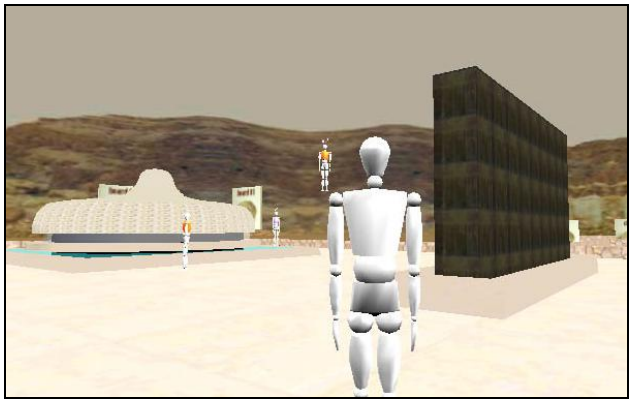

Fig. 2. The virtual world of SEE, resembling the Shrine of the Book premises at the Israel Museum, Jerusalem.

Three implementation phases between 2002-2004, involving approximately 1500 students and teachers from Italy, Israel and Belgium, gave very rewarding results and led to the development of new projects – Learning@Europe and Learning@SocialSport.

3.1.2 Learning@Europe

Learning@Europe (L@E) started in 2004 in collaboration with Accenture International Foundation. It targets European high-school students, between 14 and 19 years of age, and aims at promoting values such as awareness of one's own national identity, respect for others' national identities, and development of a common European identity.

Students from 4 different European countries at a time meet in the 3D environment (fig. 3), study and discuss the history of each other's country, present their own national symbols, reflect on the historical development of theirs and others' national identities, and find that – again – similarities in national values, as well as in their own lifestyles and interests, are more relevant than differences [8] [10] [22].

Fig. 3 Students' Avatars in the 3D world of Learning@Europe.

As a result, they conclude the experience with an improved attitude towards other nations and their history, a more articulated view of what Europe is, and – often – a sense of surprise at discovering how much their country is found interesting and respected by other nations.

Since 2004 over 6000 students have been involved in L@E. Surveys to teachers reveal every year high or very high improvements in attitudes towards other cultures for 70 to 89% of students; at least 35-50% of students acknowledge in their surveys a marked change in their opinion of other countries and Europe.

Again, chat logs and students' research works offer further, qualitative evidence of this:

"*In these days we have known each other better and we have found out many things in common! We love sports and music even if Italian music and sports are different from the Belgian ones. Anyway we are becoming a united team and interact a lot thanks to the forum and the use of English!*" (year 2006 – Belgian class);

"*the most interesting thing was the surprise, the discovery during the dialogue with fellow students of other nations, that we are not so different after all. We did the same things! When we were losing and tried to make light of it, when we complained, or when something funny happened… we enjoyed the same jokes and laughed at the same things*." (year 2006 – Polish class).

Fig. 4 Students during Learning@Europe online sessions.

Another relevant change of attitude remarked by many teachers was the discovery, by the students, of their "European-ness"; a French teacher said: "*before the L@E experience my students felt French; now they feel French* and *European*" (focus group, year 2006).

In school year 2007-08 *Learning@Europe – Special WestPoint Edition* involved for the first time also an extra-European school: 2 classes of cadets from the US Military Academy of WestPoint, NY (fig. 5).

The American students (at their first year of college, i.e. having the same age as European students in their last year of high school) had a chance to study European history together with European peers, and to find out (as one of them commented) "*how people in Europe view history*".

On the other hand, European students could compare their national identities and symbols with the American ones, finding interesting similarities and differences, and getting an "outsider's view" of their history.

For example, a discussion in the forum started about the "American Dream", which French students were studying in school as a social-historical phenomenon and which US students were very curious to know about: "*what exactly did you learn about the "American Dream"? I'm sort of curious as to how that subject would be taught, because to be honest, I have never considered it to be any one finite thing. More or less, I have always considered it to be unique to the individual, so what exactly the "American Dream" is would interest me.*"

Values such as respect and curiosity for other cultures and identities extended beyond European borders.

Fig. 5. Cadets of the West Point Academy (U.S.A.) engaged in a Learning@Europe session with peers across the Atlantic.

3.1.3 Learning@SocialSport

Learning@SocialSport (L@SS) started in 2006 as a collaboration with Verde Sport of the Benetton Group and Fondazione Italiana Accenture.

It targets teenage athletes practicing sports in sport associations all around Italy and it aims at promoting values such as: social responsibility in sports, sport ethics, mutual tolerance, and awareness of the psychological benefits and possible dangers related to body and personality development in young people practicing sports. 90 athletes between 12 and 19 years of age have been involved in the first edition of L@SS, in school year 2006-07; approximately another 100 will take part in 2007-08.

Surveys to the young athletes and their trainers after the experience show increased awareness and interest (60 to 80% of athletes and 70 to 90% of trainers) for the social value of sports, in addition to increasing dialogue about these issues between young athletes, their trainers and their families [24].

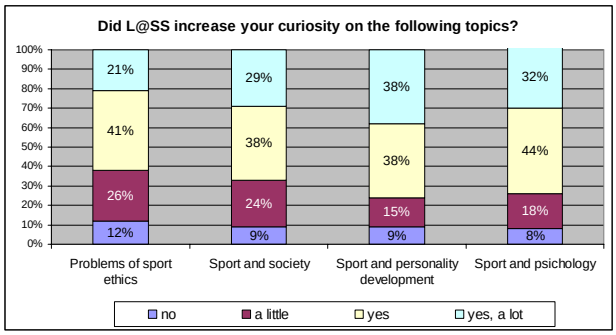

Fig. 6 Participants' increased curiosity of L@SS topics

Again, quotes from surveys and chat shed light on the highly positive outcomes of the program: "*before participating, I thought that perhaps doping could help me. Now I don't think so anymore*". A basketball player realized that "*inside a group you must learn how to coexist, and to tolerate also things that you don't like*".

Someone discovered that "*sport associations can be an opportunity for young social minorities. Sport for them can be a good way to emerge.*" About the sometimes very demanding requests by their trainers, a group commented: "*We must know that we are working for ourselves, and that improving ourselves is our goal*".

In particular, a very intense discussion in the 2D chat followed a tragic event happened in Italy a few days before one session (i.e., the killing of a policeman by violent hooligans after a soccer game). The young athletes commented the fact and made a very clear distinction between what they called "sport wickedness" and just regular wickedness. They defined "sport wickedness" as that energy that "*makes you row with all your strength for the last 500 metres*", or that "*makes you jump higher for the last points of a tie-break"*: it means "*trying with all your strength and never giving up*" and it is always within the rules, whereas regular wickedness is the one showed by those murderous hooligans who, everybody agreed, were not real "sportsmen" at all.

Even trainers, who were not the main target of the program, benefited from it; one said: "*now I understand that I'm a trainer of people, not just of athletes*".

3.2 Values through Interactive Storytelling

Web based storytelling tools represents a typical example of technology that naturally helps to convey values [2]. Storytelling is the ancient art of transmitting knowledge, traditions, events, cultural, societal, or historical messages, into a narrative flow of words, images, and sounds, and has attracted the interest of technology developers since the early years of hypertext, even before the birth of the web [26].

We have exploited the paradigm of collaborative, web-based, "hyper" storytelling in the Policultura project.

Policultura (from the Greek πολύ - "many", and the Latin "cultura" – "culture") is a broad initiative of our University that aims at promoting a positive attitude towards technology in students and teachers (oftentimes missing in our country because of the "classical" tradition of our educational system) and fostering symbiosis between humanities and technology in schools.

As part of the Policultura strategy, since 2007 we launched a *competition* among all Italian high schools: participants are requested to create, in three months, a hyperstory on either the *art* or the *history* of their territory using a simple authoring tool created in our lab. The tool is called *1001stories* and was built with the goal of making *simple, cheap,* and *fast* the *collaborative* development of *multichannel,* non linear, multimedia stories.

1001stories is a web-based environment that provides a set of functionalities needed to create a multimedia hypertext and to deliver the resulting application *on different channels* in a few clicks. Even inexperienced developers can build an interactive multimedia narrative and make it available in different physical settings and situations, both on-line and off-line: through the web (e.g., at home, in the office, in the computer labs at school or in a museum), through a CD-ROM (e.g., on a museum kiosk or in the classroom), and through a mobile device like the iPod.[16]

By effect of the Policultura competition, 1001stories was adopted by 410 classes from all over Italy, for an estimated total of 8000 students and 700 teachers involved.

Fig. 7 Hyperstory created by primary school children

We measured value-related benefits of using our hyperstory tool by means of a contextual inquiry study in a local primary school (involving 24 children aged 10-11) and a questionnaire submitted to 70 high school teachers from all over Italy who participated in the Policultura competition in 2007.

The main values we considered were "interest" and "curiosity" for local culture and history, "willingness to learn", and "willingness to collaborate with peers". In addition, we investigated (in high schools) the attitude of looking at humanities and technology as symbiotic disciplines.

In the primary school, children all seemed happy to work on their project - *also students who are normally passive and disinterested in school activities* - and always asked to "do more". In some cases, they "forced" the teachers to bring them to the computer lab even outside scheduled sessions, to search for new material on Google and to improve their hyperstory. *"I wish I could use it* [the tool] *at home so that I could continue my work there!*" "*I would like to do it again!!!*" *"Is the story time over? Can we skip the break and continue?"* are some of children's comments recorded during our study.

Primary school teachers, skeptical at the beginning, became in time more and more enthusiastic, showing an increasingly positive attitude towards the potential of technology as an educational tool. At the end of the school year, they "advertised" the project within their institute in such a positive way that in 2008 four different classes from the same school registered to Policultura, involving also younger students, for a total of over ninety students aged 7-11.

Fig. 8 Discussing the Hyperstory together (primary school)

An interesting phenomenon was the *propagation* of a positive attitude towards culture from teachers and students to children's *families*. The topic of this primary school's hyperstory was "Milan during the Roman Age", and children *engaged parents or grandparents* in the project asking them to visit *together* the places and monuments in town that date back to Roman times – an experience that most adults had never done before[2] - and to take pictures to be included in their story.

In high schools, the comments on teacher's questionnaires show a significant *increased interest in the subject matter* (74% of teachers agreed on this point), and *improved teamwork attitude* (72%). On the question related to humanities-technology symbiosis, 44% of respondents declared that content-authoring experiences like the one promoted by Policultura are "*effective*" to promote this kind of symbiosis, and 56% found them "*very effective*".

We also asked teachers to compare the achievement of the above benefits in the context of the hypermedia development experience against the achievement of the same benefits *in the context of conventional school activities*, using a 4-points scale: -2 ("much lower achievement"), -1 ("lower achievement"), +1 ("better achievement"), +2 ("much better achievement").

More that 50% of the teachers reported that the experience induced *a much higher achievement of all learning benefits considered*, if compared with conventional activities that are carried on at school to address similar learning goals.

80% of teachers mentioned that the overall experience was "stimulating" and "engaging" for the students and for themselves, raising "interest", "strong enthusiasm", and "collaborative participation" "*also in students who are normally unmotivated towards learning and have very limited interest in conventional school activities"*.

3.3 Lessons learned

The projects reported in the previous section helped us to understand some requirements that should inform the design of a web environment for young people that account for values. These requirements mainly address the dimension of *content* and *user experience.*

The multimedia content to which young people are exposed, or which is needed to perform given tasks on the web, should not only be age-appropriate and designed to achieve given informative and functional goals. It must be conceived since the beginning to meet *value-driven communication goals*. It must convey values through proper critical information, promote reflection, and support explicit value messages.

Still, the quality of content per se is not enough to be conducive to value persuasion. Values in young people are communicated and perceived also, and above all, through the quality of the "experience" [1].

The term "experience" is associated to a wide range of meanings, and no cohesive theory of experience and experience design exists [9][18][20][23]. In some cases, an experience is defined as the set of user-product interactions and all aspects of "experiencing" a product – physical, sensual, emotional, social, and aesthetic. Some authors [13] propose that the concept of experience is more scalable and can also refer to the use of a

[2] Children on the contrary had a school trip to Roman Milan before the project

product in time, thus considering the activities of users engaged with technology for a possibly long period, in a given context, and to achieve given goals or effects – a concept that is referred to as "large" experience.

For the transmission of values, a short term interaction can give a person the experiential feeling of a value and create an temporary emotional relationship with it. But more important are long-term, *large* experiences, like the ones carried on by our students using our 3D virtual worlds or our storytelling environment, or the ones of young online players engaged in long lasting online games. It is this kind of experiences that make the perception of values durable – something that young people recognize as theirs, and remain as long-lasting impressions that endure after the digital experience.

While it might be easy to keep a young person engaged with a system for a short time, having youngsters involved in web-mediated activities that have "something serious" behind (i.e., are not just pure fun) is a complex task.

Our experience highlights that game-based interaction, competition, focused and goal-driven social interaction, "situated" virtual activities (i.e., activities that are anchored to contexts that are meaningful for young people, e.g., creating a story about the art or history of *your* territory) are all means to keep youngsters engaged, but should also be systematically interplayed with "serious moments" where cognitive effort or reflection on values are required.

Finally, the fulfillment of the tasks required by the experience should draw directly on the knowledge and values that the interaction with the system is designed to foster in its users, and should promote the application of such knowledge and values.

4. RELATED WORK

The work reported here distills the experience achieved along many years of working with young people and educational stakeholders and of designing communication-oriented web applications.

Our systematic reflection on "values and the web" started with a research on brand and the persuasive dimension of the web, which was largely stimulated by e-culture projects we carried on since 2004 in cooperation with teams from Islamic countries (Morocco, Syria, Algeria, Tunisia) where "understanding others' values" was a necessary prerequisite for any activity and collaboration.

[5] is our first work in which these concepts are framed in an organic way, and *values* are placed as first order citizens in a *modeling framework for web requirements.* Here we considered only brand aspects, exploiting the concept of brand as a *promise of value* [4] that an entity behind the web experience can keep to all its stakeholders - customers, trades, stockholders, employees, fans, or supporters. In a following work [6], we extended our framework to consider a wider range of values, and experimented our approach in different contexts.

A reflection on "values and the youngsters" was necessarily induced by the multinational projects in 3D educational environments reported in section 3 [11][10][22][24], but the present article is the first work in which we provide a comprehensive discussion of most of our e-learning projects from a value perspective.

Some of our reflections are inspired by existing design approaches in HCI, requirements engineering, and web engineering.

Values sensitive design (VSD) emerged in the mid '90s in the HCI community as an approach to the design of information and computer systems that accounts for human values in a principled and comprehensive manner early and throughout the whole design process. Value sensitive design particularly emphasizes values with moral import, including human welfare, freedom from biases, privacy, trust, moral responsibility, honesty, democracy, environmental sustainability, and similar. Some works in VSD [14] exemplify how different aspects of web design can account for such values, and how specific values can be undermined or promoted by the technology, thus shaping (but not rigidly determining) individual and social behavior.

Value centered design (VCD) [7] shifts the focus from "value as human belief" (as promoted by VSD) to "value as worth", that is, whatever some people somewhere find worthwhile, individually or collectively, irrespective of ethics, wisdom, style, taste, etiquette or the approval of others. Values are regarded as a *motivator* for investing time, money, energy, or commitment in the development or use of a web product or service by all (direct or indirect) stakeholders.

In the broader approach known as *persuasive design* [12], some studies have been carried on that address how the web can change attitudes and behaviors, and a set of guidelines are proposed for web persuasion (e.g., to foster reliance, credibility and trust, or to instill values such as environmental attention, or to induce healthy habit changes in users' life), which adapt basic communication and argumentation strategies (some of which date back to Aristotle).

Emotional design [21] investigates, among other aspects, how emotions during a web experience can create "value" for the user in the sense of pleasure, fun, calmness, trust, and also can make a persuasion action more effective.

In the requirements and web engineering communities, *Value Based Design* (VBD) [3][17] provides a more pragmatic and systematic approach with respect to HCI design works, but it looks at the notion of "value as worth" from a strictly business perspective, in terms of the *economic benefit* that is induced by a system and makes the company or institution more competitive and profitable.

5. CONCLUSIONS

The works cited in the previous section show that the idea of using the web as value promoter is certainly not new. Still, this approach has been so far "marginalized" and considered a niche research area, and has not been so far proposed as part of a broader vision for the overall web community. More importantly, to our knowledge value-driven approaches to the web do not address young people, unless in the context of *formal* education on the one hand, or of gaming on the other hand.

Given the importance of the web in the lives of young people, it is critical to consider how to create online interactive environments that also address this target, besides being easy to use, age-appropriate in content and interface, and able to foster exciting learning activities in and out of the classroom.

We need to develop web experiences that enable youngsters using web technology in their every day life - at home, in public places, during play or sport, to question what they know, to reflect on their values in relationships to those of their peers, to understand and respect other cultures and ways of life.

Implementing this value-driven vision of the web of the future

is probably more a matter of methodology and user study, than technology. Researchers must strive to understand the unique needs of youngsters in order to develop innovative web solutions that provide high quality value-driven experiences. It is essential to understand in depth the messages a web application seeks to communicate, and how to communicate them effectively to young people. This means finding the "language", communication forms, and media, which are most appropriate for this target, and designing activities and tasks that draw on values and are most adequate for conveying them. This work requires multidisciplinary competence (e.g., in user requirements analysis, design, communication sciences, social sciences, psychology) and a deep feeling with the youngsters. It must be supported by proper conceptual tools that are presently missing, and can benefit from empirical studies on value communication impact.

From a technology perspective, a value-driven approach can foster novel applications of new technological solutions as they emerge (as it happened for shared virtual worlds), or suggest new requirements for future technologies.

A *value-driven semantic web* may be conceived, for example, which exploits value ontologies and novel forms of value-driven reasoning and search on the web, which in turn can be exploited by tools that support the creation, retrieval, and organization of digital knowledge sources according to value-based criteria.

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