Video as a first-class object for promoting scientific research, innovation and training

Sebastjan Mislej, Davor Orlič, Luana Maliqi, Peter Keše, Mitja Jermol
Department of Knowledge Technologies and Center for Knowledge Transfer,
Jozef Stefan Institute
Jamova 39, 1000 Ljubljana, Slovenia
Tel: +386 1 477 3814; fax: +386 1 477 3315
E-mail: Sebastjan.Mislej@ijs.si,
Davor.Orlic@ijs.si, Luana.Maliqi@ijs.si,
Peter.Kese@ijs.si, Mitja.Jermol@ijs.si

ABSTRACT

This paper is an overview of the web based video educational portal Videolectures.Net *(see picture 1.)* on http://videolectures.net. Nowadays it is common to say that information and communications technologies are rapidly transforming the world of research. The global dissemination of science and knowledge – the most fundamental and universal of human cultural achievements – has lagged far behind. Bringing together the general and specific science public and/or authors and being global by using a web based dissemination channel, science bonds many institutions and scientists. At this moment a consensus is emerging that science and knowledge should aim to be open and free and aim at a general public benefit or at least that access to the underlying research and communication tools should be open and usable to the maximum extent possible. This is what Videolectures.Net is trying to achieve on a global scale.

Key words:

Video content, video lectures, Data access, Science policy, Data sharing, Data management, Database, Archives, Scientific infrastructure, Global e-science, OECD, Public domain.

1 INTRODUCTION

The paper argues that publicly funded research data are a public good, produced in the public interest. As such they should remain in the public realm. This does not preclude the subsequent commercialization of research results in patents and copyrights, or of the data themselves in databases, but it does mean that a copy of the data must be maintained and made openly accessible. Implicitly or explicitly, this principle is recognized by many of the world's leading scientific institutions, organizations, and agencies. Moreover, as research becomes increasingly global, there is a growing need to systematically address data access and sharing issues beyond national jurisdictions.

As scientists were innovators of the Internet, openness is a crucial issue for understanding the production and institutionalization of knowledge in a global context. Norms and practices of openness, arguably, have been vital for the work of modern scientific communities.

Their pressing needs for more powerful information processing and communication tools have led to many of the key enabling technologies of the "Information Society," including its mainframe computers, packet-switched data networks, the TPC/IP protocols of the Internet and the World Wide Web, its proliferation of markup languages, the Semantic Web and many more recent advances that facilitate distributed conduct of collaborative research.

Expanding the adoption of this principle to national and international stages will enable researchers, empower citizens and convey tremendous scientific, economic, and social benefits.

2 THE BENEFITS OF VIDEO AND KNOWLEDGE SHARING OF RESEARCH RESOURCES: PRESENT OPPORTUNITIES AND FUTURE TRENDS

The current impact of the video is very strong, it has transformed the perspective on the Internet in general, making it even more accessible to the general public and thus has built up its own community. The problematic side is the content, having millions of

humorous clips and advertisements, homemade clips and similar contents, has made its progress very rapid, engaging the community into a development race. Because of these reasons the overwhelming media input could not pass the scientific community, whereas this specific public has been neglected because of its research nature although having an enormous amount of past and present material to be used in video form. Basically the future of the video on the Web most certainly belongs to education and its will to be exploited most openly in these terms.

3 ACADEMIC VIEWERS vs. GENERIC VIEWER

The benefits of structured and multimedia presentable Information within the concept of Sharing Knowledge on a digital playground following up the premises of a future impact of the video on the web are the strongest resource of future education.

What are the mutual features of these two population's intersections - and of the orientation of their guided processes? Search for Knowledge or Information? To answer these one must priory define the nature of interaction between these two concepts. Following up the premises of the nowadays humorous use of the video on the web, counter parting science videos we come to a clear conclusion that basically Knowledge is consistent of Information, but Information itself is not necessarily Knowledge. It is the Usability and Adequacy with the given moment that defines their structural Design. An open media platform such as Videolectures.Net is trying to built up - with the possibility of participating interactions - could be a basis for generating a time consuming and explicit distinction between the transferred content's essence and its potential use. If media should be a system whose primary service does not exceed a mere capability of transfer and of Information display, it would on wider scale present either unstructured or at least unexploited Information in a process of possible modeling of Knowledge. To achieve a continuation of upgraded implementation of Information, in our case the lecture, of the Knowledge models - defined by their contextual accordance and its usability, two essential criteria should be met: prompt accessibility and abundant representation of the Information. The first criteria enables the interaction that is necessary for accumulating, flow and clarification of Information, while the second criteria provides additional data that accelerates the first criteria to its final goal - a potential usability. The phenomenon of Web provides both - a network of possible storage, access and sharing through its multimedia modal form and in presenting the information. The main issue that needs to be resolved is organizational and structured aspect of managing the information on such network, which in it's digitally illimitability of presentations and access is becoming the world's largest online conference, library storage and a global Information meeting point. The above mentioned issue of Information management requires as well a process of reeducation of people using the media. An example of a proper potential use of this media is crucial to transform the web platform from a state of a mere possible expressionistic trash can of meta-communication and interaction. In this direction a new topic could be introduced - a knowledge management on a digital platform. Coherent to this 'information for eventual knowledge' seeking people may establish an evolving culture of sharable knowledge principle. Eventually, this could result to progressive balance of implemented diversities on a global level presenting Knowledge globalization as a system with complexity and intelligence maintained by its organized structure.

The ability of generating knowledge for global expantion of its applicative usage, may result in creating information and humanistic oriented society, a community that would not be enchanted or distressed by the illusion of media accesibility concept, but would rather apply its interests in interacting with its content for complementary and balanced oriented globalization of knowledge.

Therefore a current difference between the web appliance and participation of an academic and general user should as well be an eventually mutual link to complementary, structured and sharable Information on a digital platform.

3 WHY IS OPEN ACCESS FOR SCIENCE IMPORTANT?

Open access to data and its sharing reinforces open scientific inquiry, encourages diversity of analysis and opinion, promotes new research, makes possible the testing of new or alternative hypotheses and methods of analysis, supports studies on data collection methods and measurement, facilitates the education of new researchers, enables the exploration of topics not envisioned by the initial investigators, and permits the creation of new data sets when data from multiple sources are combined. Sharing and open access to publicly funded research data not only helps to maximize the research potential of new digital technologies and networks, but provides greater returns from the public investment in research.

Moreover, improving and expanding the open availability of public research data will generate wealth through the downstream commercialization of outputs, provide decision-makers with the necessary facts to address complex, often trans-national problems, and offer individuals the opportunity to better understand the social and physical world in which we all live.

4 VIDEOLECTURES.NET CASE STUDY – PAST PRESENT FUTURE

The main aim of the project Videolectures.Net is the exchange of ideas and sharing of knowledge. It focuses on how to provide high quality didactic contents and thus provide high science to the broader public. Within the project occurs the systematic and editorial classification of information, documentation, links and lectures in video contents of the most important and prominent events from the field of Informatics. The contents are being developed within the FP5, FP6, and FP7 European Framework Programs, where the web educational portal Videolectures.Net is being used as an educational platform by EU funded research projects such as PASCAL NoE, ECOLEAD NoE, SEKT IP and different organizations, among others Xerox Parc, British Telecom, Max Planck, Fraunhofer Institute, Australian National University and Carnegie Mellon. The range of countries involved and languages used varies from Ukraine, Europe, USA, Taiwan, Australia and Brazil.

The project Videolectures.Net has been started at the Jozef Stefan Institute, Slovenia, Europe in early 2002 in synergy with the global trends and more formal efforts by the European Union in creating a Knowledge Economy and Information Society. The pilot project was started by our group where the main idea was to record on tape a weekly section of lectures named "Solomon's seminars", these same lectures are being held until present time at the Department of Knowledge Technologies, JSI. Currently the project is encompassing contents from Informatics and subfields field of Artificial Intelligence, Machine Learning, Semantic Web, Data Mining.

The portal is becoming a major reference tool for academic researchers and in this sense new frameworks and future plans are being prepared aiming at becoming an e-science video reference with a possibility of being a base line media for live streaming of local and global events, building up a major consortium of high quality universities that would provide a qualitative stream of future planned and existing training programs. One other major goal is to cover all the major world scientific conferences for general and specific scientific users in different areas and to expand the academic disciplines for every possible viewer to Fine Arts, Humanities, Social studies and Law.

1. Videolectures.Net front page

5 USABILITY FEATURES

The features of the portal are designed as to make comfortable users with different scientific backgrounds. There are two types of users of the portal namely the lecturers and/or students.

By registering into the site, the lecturer is given the right to have full authority over his academic materials. He has his own online videography http://videolectures.net/noam_chomsky He is able to synchronize its own presentation and edit its material – descriptions, curriculum, etc. – link its presentation to his personal web page with html snippets and upload his own additional video presentation.

From the viewers' perspective, the lecture can be validated and ranked, comments for debate can be added, the video can be accordingly categorized and the presentation (ppt. PDF and other formats) can be downloaded or viewed as a separate page. A major advance in the respective field is the feature of videos synchronized with presentations http://videolectures.net/bootcamp07_keller_bss *(see picture 2.)* which offers larger comprehension value. Related videos are also shown, and the users' personal history is placed as a reference tool. The videos are subtitled in two different video formats, .wma and .flv. That is due to different user software habits and thus a more effective public performance.


2. Synchronization user interface

6 EXPECTATIONS AND STATISTICS

The portal gained its today's appearance on March 14th 2007 and doubled its capacities from the starting 1492 to 3090 scientific video lectures in a short span of 6 months. At this given moment the repository offers to the viewer 150 events, 1840 authors, 2456 lectures, 3085 videos. These lecture videos are spanning from separate unique lectures given by lecturers on different occasions to specific and general training programs http://videolectures.net/kdd07_tutorials, workshops http://videolectures.net/iswc06_workshop conferences http://videolectures.net/eccs07_dresden and science videos combined with art http://videolectures.net/eccs07_sturzbecher_perf . Statistics are showing a 60% rate of returning users and 40% of new visitors. A very positive indexing can be shown over the traffic sources overview with 24,714% of users coming through Search Engines, 11,571% from Referring Sites, Direct Traffic is managed with 21,69%. The page view expectation is about a million by the end of the year 2007. As a comparison regarding scientific video contents the MIT video repository counts approx. 450 video lectures, Google Tech videos 441, Princeton University counts approx. 350 videos. All the video contents at http://videolectures.net were recorded by the Videolectures.Net team, the software and internal infrastructure was also built exclusively by the Videolectures.Net team.
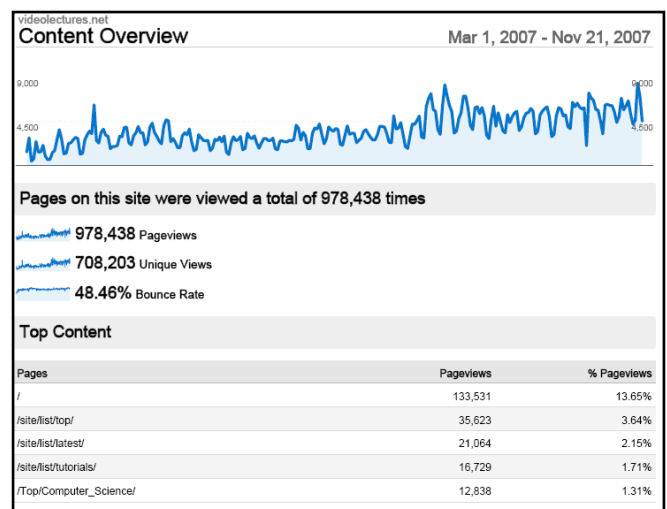
3. Content overview

7 LEGAL MATTERS

As previously mentioned the educational portal Videolectures.Net is an open resource of educational videos and more where the authors need to have the clear and unambiguous freedom to engage in their normal everyday scholarly activities without contending with complex technology, continuous amendments to contracts, or the need for a lawyer. That is why the portal is using Creative Commons licenses (CC license) for its legal background. Knowing that at this historical point science needs to open the usage of Creative Commons provides free tools that let authors, scientists, and educators easily mark their creative work with the freedoms they want it to carry. They can use CC to change copyright terms from "All Rights Reserved" to "Some Rights Reserved." The key terms of the core suite of Creative Commons licenses are: Attribution, NonCommercial, NoDerivatives and ShareAlike.

8 CONCLUSIONS

The World Wide Web was designed in a scientific laboratory to facilitate access to scientific knowledge. In every other area of life - commerce, social networking, and nevertheless pornography - it has been a smashing success. But in the world of science itself?

The genius of the web is that it is an open network. Anyone can link to any part of this page, or in the future to that video, and anyone else can link to that link. That web of interconnections, cross-citations and linkages is then captured by search engines. We gain not only the knowledge in the content, but the knowledge supplied by those who read the content, who make connections the original author could not.

9 ACKNOWLEDGEMENTS

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