Integrated Information Management in Physics

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1 Introduction

The industrial revolution from **Printed Matters** to the **world wide web of electronic hypertexts** is a phase transition to a new-age-of-information, remoulding almost all aspects of life.

We here dwell mainly on the impact on the Physics Community. Many aspects, however, are not specific to Physics but apply basically to many other fields of human activities especially in science of course.

Physics means searching for the laws of Nature by experiments and by developing theoretical models casted in mathematical structures to predict the experimental results. The question here is, what can information technology help and how will this process be affected by the new age of information.

In the first part I give scenarios of some aspects of physicists work.

[1] http://www.physik.uni-oldenburg.de/Docs/theo3/hilf.html

[2] http://www.physik.uni-oldenburg.de

[3] please feel free to set links to this text or copy it to your own server or cache, or even print and distribute it, the proper citation is *E. R. Hilf, Integrated Information Management in Physics; Conf. EP-ARCHIVE, ed.: R. A. Kelly; Los Alamos LANL, Octobre 1994*

[4] If you happen to read a printed copy of this LaTeXtext, you miss the main part of the work. You should turn to the full hypertext, available at http://eptalk@aps.org/EPRINT/papers.html. After expiration of that link the more permanent address will be http://www.physik.uni-oldenburg.de/ hilf/vortraege/ep-archive/ep-archive.html . Be patient, our University is connected by a 64kByte line at present..

We then will present the action that the German Physical Society DPG [5] is planning in close cooperation with the APS[7], the American Physical Society.

Only specific action, world-wide coordinated and interlinked with other fields activities will be able to actively participate in the casting the future.

2 Organizing the e-print archiving

2.1 adjust the present organization or turn to a new one?

Should the present professional organizations take care of the new tasks or should there be new organizational strucuters?

In history the introduction of railways has led to the new organizational structures of the present railway companies and railway government structures, which once established have done their task in a sophisticated, professional and dedicated way. Thus even if nowadays one wouldcomeup with the opinion, that another way of organization might be better, due to the huge inertia of the present large system, the high dependance of the public on the continuous availability and the enormous political and economical power, - the barrier for a transition is unsurmountable high and can not be overcome.

The habits of travelling have adjusted over time, often unrealized.

Similarly for another industrial transition: the letter printing. Over the time a highly sophisticated intricate, professional system of libraries, distributors, bookshops, publishers, referees, has developed which serves the public.

The reader's habits have adjusted accordingly, and so have the authors. Scientists think in terms of papers to be published as part of their career and scientific progress.

The organizational structures have grown from small individual enterprises, having had the right ideas andmeans at the right time, such as Mr. Elsevier for the international scientific journal.

The organizational structures from the times before the transition, -cloisters with monks copying by hand, horse-riding messages (Boten), although they still exist, do not play an important role.

[5]with its ELFIKOM[6] Arbeitsgruppe elektronische Fachinformation und Kommunikation Deutsche Physikalische Gesellschaft DPG

[7]http://aps.org

2.2 Should there be lobbying or public advertizing?

History tells that lobbying to get the money is certainly important. But in contrast to the task of introducing a similar product into an existing market, acting in the time of an industrial phase transition has advantages: The earlier an initiative the less competition. Although the public, thinking in the traditional way has often infinitively high objections against a change to the unknown for a solution to their known needs, their are two options: trying in vain to convince the future customer or just proceed with the experience that those who use the new tools see immediately the superiority and prospectives. Thus I propose to proceed. [8]

2.3 propositions

The Ginsparg-initiative has given a fruitful answer to the preprint service and its archiving. It is at present run in a National Research Center.

The Physics Societies should take means to guarantee that this service is available on a long term basis, -even when the LANL is closed,- and extend it to other fields of physics. Thus the physicists worldwide should be urged to join using the server. The Physics Societies should either take over the service, or mirror it, or delegate it to companies with the respective boundary conditions.

It should be accompanied by setting up servers at all physics laboratories and give access to all physicists to the web. This is more an educational task.

In addition, the Physics Societies should set up dedicated electronic services in specific fields, including the exchange of data, the coupling of computers and programmes.

Furthermore a huge task is the set up and offering of information providers, filters, dedicated work-surfaces, retrieval assistance, etc. This is a whole new market and needs all kinds of professions, software writing, distributors, librarians, editors, etc.

The properties of such services being developed by the prospective users, the service and installation is best in the hands of the Societies or their industrial partners.

Whether some of the present industrial bodies such as publishers, libraries, distributors, are taking the pole or whether new structures will form, should peacefully

[8] The German Government, in spring 1994, - in the middle of the heated phase of the transition, had an at first sight brilliant idea: ta full flegded set of hearings was organized to get the opinions and views of all institutions and bodies, who would in the future be part of the new system. Since almost none of the attending persons had any experience in electronic printing or archiving the result was a bunch of precautions, hesitations, and warnings with no technical progress. This meant in total a stall however.

be left to the indsutrial competion. The present large international publishers and the University Libraries do have the advantage of a large staff of professionals and a established set of referees. So, **if** they enter they will be transformed but survive. But probably other, even new companies with less inertia will have a perfect chance. Since one can not forsee the future development, and has no meansto steer it , we here should not point a direction but offer to all willing to participate our collaboration.