THE ELECTRONIC MATHEMATICS ARCHIVES NETWORK INITIATIVE (EMANI)

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The aim of the Electronic Mathematics Archives Network Initiative (EMANI) is to provide long term preservation and access to mathematics literature. A network of reference libraries will provide the infrastructure. Born digital content will be supplemented with retrospectively digitised material.

Archiving mathematics

During a period of approximately ten years, electronic publications in mathematics developed, from a handful of offerings in pioneering, freely accessible journals, into a first class publication facility, with enhanced services in comparison to the traditional printed publications. The problem of archiving electronic offerings was an important question from the beginning, but the vast amount of current material available electronically has lead to a situation, where more concrete answers to the issues must be given. Additionally, the many retrospective digitization projects require us to find an urgent solution.

In the first half of 2001, several projects arose to try to tackle this question and to develop models for the archiving of electronic content. One such project, the Electronic Mathematics Archives Network Initiative (EMANI) is aimed specifically at mathematics. Since a distributed architecture is deemed better suited to the task and would reduce the load on the partners of the project, a network was proposed. This may lead to a more open approach for extending the project from an initial, restricted solution to a more comprehensive enterprise.

Though some of the subsequent arguments may apply to all sciences, they are of particular importance for mathematics: Mathematicians and professionals applying mathematics need quick, reliable and integrated access to mathematical publications. Long-term availability of publications is a particular need in mathematics. Electronic storage and access to publications in mathematics are confronting content producers and libraries with challenging problems. How do they maintain and provide these services in the future? Digitizing of print-only publications, and the adaptation of these offerings to the current

facilities provided for electronic publications, leads to a new series of problems to be solved. Electronic publishing offers a variety of additional information in mathematics, which has to be integrated into the access of traditional types of publications.

EMANI will need to address all the aspects mentioned above, leading to ambitious aims and goals for the project.

Aims and goals of the initiative

For the core of the network, a co-operative system of reference libraries and content providers (e.g. publishers and editors) will be set up. Ideally, the final version should serve a long list of purposes.

The initial action will be to store the digital content in mathematics from the content providers at the reference libraries. This will be complemented by retro-digitising all printed publications in mathematics (supplied by content providers) at the reference libraries. This would eventually provide electronic versions of a major proportion of the publications. On this basis the first steps can be taken towards addressing the long-term preservation of this content in readable form.

However, just to have the content stored somewhere will not be sufficient. Retrospective digitization may lead only to scanned images, which, it is hoped, could be accessed in some repository. A necessary enhancement will be to improve the usability of the retro digitized publications via advanced linking and searching facilities, and also to provide mathematicians and professionals world-wide with convenient and affordable access to the stored content.

The reference libraries may even serve as a reference system for other libraries that want to store and provide part of the content or refresh their existing offerings with updated material. Bearing in mind the age range of the publications provided over the network (articles from the 19th century to current publications), a system of distribution agents will be needed. This may be a good reason to develop new business models for the distribution of mathematical publications in a joint enterprise between reference libraries and content providers.

The starting point

Owing to the complex nature of the project, the enterprise should initially start on a small-scale. Once the architecture and the action plan have been more precisely defined, an extension to the scope could be considered.

Libraries involved in implementing the initiative:

- **The Cornell University Library, Ithaca, N.Y.** Cornell have a good tradition in retrospective digitization projects and are also involved in the archiving discussion for other sciences.
- **The State and University Library Goettingen** Also involved with important retrospective digitization projects like ERAM and DIEPER. Additionally, the SUB Goettingen is obliged to collect all publications in mathematics.
- **The Tsinghua University Library, Beijing** Tsinghua has experience with the digitisation of Chinese publications. It is a Chinese centre of excellence for installing and offering electronic publications.

The participation of the Library in Orsay, Paris, is the subject of current negotiations.

Content providers currently involved in implementing the initiative:

- Springer-Verlag;
- Birkhaeuser Verlag;
- Teubner Verlag;
- Vieweg Verlag;
- The European Mathematical Information Service;
- ElibM, the electronic library offered through EMIS.

The four publishers have along tradition of publishing in the field of mathematics. Their collections include several of the best journals in mathematics. In contrast to this, the ElibM is a co-operative undertaking by several journals and editors, on a voluntary basis, to bundle electronic offerings in a world-wide system of WWW-servers.

It has been agreed that not all partners can address all the aims of the initiative from the start and that, even in the long run, the reference libraries may achieve only the basic objectives. One reason for this is that the reference libraries

depend on different funding systems. Further-more, their participation in other projects must be taken into account.

Nevertheless, it is a common understanding that the storage of the content in a repository will have priority in the near future and that, in general, copies of the content stored in the system should be deposited at all reference libraries, as a matter of safety. Updated versions of the content should be exchanged periodically. The partners in the initiative have agreed to provide their own resources to support the aims of the initiative and this will become important in a later phase of the project.

The first phase of the initiative is the transfer of available electronic content from the content providers to the reference libraries, where it will be checked to ensure that the files can be used for the archiving. Adjustments will be made to files not suitable for archiving and recommendations for improving subsequent delivery will be developed.

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