

# The Roquade project: an infrastructure for new models of academic publishing

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## Abstract

Due to a number of problems the traditional scientific journal has become an obstacle for efficient scientific communication. Many initiatives have been started for realising alternative ways of scientific publishing thereby using information technology. In various disciplines, however, a relatively large number of scientists are still reluctant to make use of completely new ways of publishing.

The extraordinary aspect of the *Roquade* project is marked by the fact that it offers a variety of possibilities. Together they constitute an expeditious way for gradually changing the publication behaviour of scientists. This project, initiated by the university libraries of the Dutch universities of Delft and Utrecht, aims at creating an infrastructure that encompasses the swiftness of publication which hitherto could only be realised by grey publishing, with quality judgement without the serious delay of the traditional review procedures.

Roquade offers a wide number of facilities to a broad audience, based on a common organisational and technical infrastructure. So far already 18 journals and other types of scientific work have been published within the Roquade infrastructure - and the project continues until 2002.

In the paper, both project philosophy and organisation are described, as well as the preliminary results, experiences and best practices, technical XML based choices, web marketing and of course the needs and demands of authors and readers. The advantages of co-operation and the role of the university library in facilitating scientific communication are dealt with too. An outline of the Roquade business model after the project stage will also be presented.

Structure of the paper:

1. The breakdown of scientific communication
2. Roquade: its philosophy and organisation
3. Roquade: first results
4. Roquade: business model
5. Concluding remarks
6. References

## 1. The breakdown of scientific communication

1665. The first issue of *Journal des Savants*, the first scientific magazine is published. A year later it is followed by a second journal, *Philosophical Transactions*. Both appear not in Latin but in the vernacular language, a quite unusual phenomenon during those days. What were the reasons to start these endeavours? A major factor was the rising number of researchers. Similarly important was the influence of Francis Bacon who had been successfully advocating the use of systematic and empirical scientific inquiry and who had emphasised the significance of exploring written sources. In order to stimulate the process of building on each other's findings as well as to avoid duplication of efforts scientists needed to be informed on the results achieved and collected by their colleagues. Bacon aimed at comprising library, laboratory and fieldwork.

Of course, there were books. But as a carrier for scientific information they had some disadvantages. Their main drawback - an aspect related to their volume - was their

delay in appearing, due to precious time lost in producing them. Books also featured a definite character. Therefore, they tended to be less suitable for discourses on detailed investigations. Especially if the facility of additions, comments and reply was useful. It was these aspects that were of great significance to Bacon and his colleagues. Objections to the book as an inflexible medium for distributing concise, relevant information were first expressed by physicists, physicians and technicians. Increasing international contacts among scientists required a platform on which the results of their research could be revealed and discussed. What these scientists basically wanted was to trust their rather unstructured correspondence to a medium that was neither a book nor a letter. The answer was the scientific journal. At first, the *Journal des Savants* was even a weekly magazine. The ensuing growth in various scientific periodicals was indicative for their need.

As such, this very need for communication among scholars has always been the very *raison d'être* of the scientific magazine. Editors were appointed to judge the quality of the contributions and their results. Due to differences in evaluations, a hierarchy was gradually emerging. Some editors proved to be more critical than others since they had decided to introduce stricter selection conditions. Thus, a number of journals were acquiring a better reputation than others. Consequently, scientists started deriving their stature from the reputation of the journal to which they contributed. Increasingly, readers were becoming aware of the difference in quality. This difference even led to emergence of a ranking system. Finally, the ranking system resulted in playing a significant role in the evaluation of scientific papers and articles. A role that is now firmly established. So-called citation indexes are important tools in the evaluation of articles. These indexes refer to the citation frequency of articles as well as to the reputation of the magazines in which the articles are cited. The composition of the indexes even evolved into a new discipline, bibliometry, in which these indexes constitute a basic element. As a result, scientific journals have become a distinct factor in evaluating academic research programs. Oddly enough, the same people who favour the current scientific journal consider this factor as the main argument for continuing its existence. But do we really have any reason to be satisfied with its present form?

'Publish or perish' is an adage that we are all familiar with. It is mirrored by the growth in the number of scientific papers. As a consequence of this growth, the existing publishing system is troubled by considerable problems.

1. Publishing is sluggish: it takes at least six months, sometimes up to a year and a half, before a submitted paper actually appears in print.
2. There is growing doubt about the system's trustworthiness, particularly since reviewers may take advantage of their prior knowledge.
3. The system is becoming unaffordable because of vast price increases, which are often higher than the general price index. These rises lead to the cancelling of subscriptions, which in turn cause new increases, eventually evolving in almost monopoly-like situations held by the publishers.
4. Furthermore, we must be aware of the fact that, in addition to these price increases, universities have to pay for these publications more than once, since they also pay:
  - the salary of university staff members who write the articles and papers;
  - the salary of the reviewer who, at the request of the publisher, judges whether the articles are suitable for publication;
  - the publication's purchase price;
  - the archiving of the publications.

We can no longer deny it: the current scientific magazine can hardly be called a communication medium if we consider the amount of time between submission and publication of an article. Fortunately, scientists are also beginning to acknowledge this. They have started publishing their pre-prints on the Internet. In fact, their article's eventual

publication in a magazine has become more of a formality, a procedure in which a quality certificate is assigned *afterwards*. Our conclusion must be therefore that the scientific journal in its conventional form can no longer play an essential role in the process of scientific communication. Moreover, this fact undermines its very *raison d'être*.

## 2. Roquade: its philosophy and organisation

Currently, an author who wants to publish his article sees himself confronted with a dilemma. If he is after speedy publication, he has to seek refuge into so-called grey literature. On the other hand, if quality is more important he must address a traditional publisher, thereby accepting a lingering publication process. Modern information and communication technology can solve this dilemma. However, many scientists seem to be a little squeamish when it comes to publishing their results. Naturally, this is partly understandable, because of the crucial role traditional journals play in quality assessment procedures. To a large extent, scientists derive their reputation from the journal's reputation. Nevertheless, their reservations towards alternatives cannot only be explained by this aspect. As strange as it appears, scientists are reluctant to participate in innovative experiments which in their eyes are risky. They tend to be more interested in projects that have a certain resemblance to the traditional publishing process, like an electronic version of a traditional journal.

Unsurprisingly, the traditional commercial publisher is not anxious to stimulate certain innovations that could change the established process of scientific communication. Traditionally, the publisher has been engaged in core activities like gathering, quality certification, registration and distribution. In the value chain spanning between information producer to information consumer, the publisher's added value is mainly in certification and distribution. The distribution of electronic documents is a process that is fairly similar to the library's function of providing access to information, especially if this task is combined with conservation and storage. In the past, the distribution of information was not considered a task of the library. It presupposed a marketing-orientated view, a requirement which libraries could only meet to limited extent. Moreover, it was thought of as an uncertain business, an aspect which subsidy funders tended to dislike. However, the distribution of information in digital form, though, is regarded as a different matter. From a financial point of view, it is seen as a less hazardous operation, because it makes use of an existing infrastructure, i.e. the academic community's electronic network.

As to quality certification, the peer review is now done by academics and organised by publishers. There are two obvious organisational alternatives to this process:

- It could be organised by publishers who do not act as information owners but as service providers hired by the university;
- It could be organised by libraries.

One of the advantages of the latter alternative is the possibility of immediate contact between library and scholars and their personal networks. For the present we may therefore safely conclude that in future the publisher's added value may no longer be self-evident.

Two years ago the university libraries of Utrecht and Delft, joined forces with the library of the Royal Netherlands Academy of Arts and Sciences to change this situation. It was the starting point for the *Roquade* project. The project aims at setting up an infrastructure for electronic publishing. Its mission is the enhancement of scientific communication by offering scientists a wide variety of facilities and organisational structures, helping them to gradually change their publishing manner. The project is directed towards all disciplines and concerns Dutch publications as well as international initiatives.

*Roquade* is distinguished by two aspects of electronic publishing support.

The first involves supporting institutional open archives. Its priorities are storing, conservation and providing access to the university's scientific output (e.g. its own publications). If every academic institution were to organise the scientific information it produces, this would result in a world-wide network of servers making full-text scientific information accessible on-line to everyone. The next step would be to order the information by subject within various knowledge domains. The essential objective of these tasks is creating a digital archive that contains the scientific output of the university, as well as preserving this information and making it accessible to the academic community. The second aspect is more discipline-oriented. It emphasises the necessity of new publishing models that stimulate scientific communication, accelerate the exchange of research results and organise open discussions within knowledge domains. Researchers can place their papers on the website of their department or set-up electronic journals. Furthermore, they are provided with facilities for publication servers and new peer-review models. The initiative for these activities, of course, comes directly from researchers within departments, from research institutes and learned societies. But in realising them they are supported by back-office processes and facilities, including the organisational and technological capacities.

For both aspects of electronic publishing *Roquade* provides a flexible infrastructure. The scientists and research institutions can use the type of publishing process they prefer: one that entirely meets their actual needs or the one that they are up to. The reason for offering extensive and limited options is that many scientists are not yet ready to use fully new ways of publishing in order to make the issuing of their research results independent from the monopoly of commercial publishers. These scholars are provided with an infrastructure that facilitates a gradual transition from traditional publishing to highly sophisticated models.

## 2.1 The main structure of the project

The general idea behind the *Roquade* project is that it consists of a set of basic components, i.e. services to scientists. For instance an editorial board can select not only a certain type of service but also one, two or all the components of the publishing process depending on his wishes or his computer literacy. Naturally, the selected components also depend on the publication type.

This general idea is reflected in the project structure and its activities.

The main structure of *Roquade* project consists of:

- Satellites: a number of subsidiary projects with a variety of possibilities:
  1. electronic substitution for traditional publishing
  2. a publication site with experimental peer review systems
  3. open archives facilities:
    - a moderated pre-print service
    - re-print service
- Generic *Roquade* infrastructure: a subsidiary project aiming at a technical and organisational infrastructure that is common for all satellite projects.

*Roquade*'s satellites and infrastructure form an undivided entity. On the one hand, these satellites use the (intermediate) results of the *Roquade* infrastructure projects. On the other hand, these results are tested, refined and further developed within the satellites projects.

In the first type of satellites, which can be described as electronic substitution for traditional publishing, two categories of publications can be distinguished:

- dissertations and conference collections
- scientific journals

Two subsidiary project types are concerned with scientific journals:

- Publishing new and existing electronic journals: this involves supporting editors who prefer the traditional form of electronic publishing. In this case, the electronic journal is an electronic 'copy' of the traditional paper journal (even when the journal is e-only: it should have the look-and-feel of an existing paper journal).
- Co-publishing: setting up a series of digital publication services for publishers, e.g. for electronic versions of existing paper journals.

Similar to many scientists most editors who are interested in setting-up an electronic journal also want to start in a more or less traditional way mainly involving text and pictures. The concept of volumes and issues – typical of the paper journal – is maintained during the start-up phase and, as in the case of traditional paper journals, peer review takes place before publication. Gradually, an broad range of additions, modifications and alternatives is possible:

- the concept of separate issues will eventually become obsolete. Articles are published as soon as they are ready for publication;
- research data can be appended;
- communication and discussion facilities can be added;
- multimedia can be used to enrich the publication.

The second type is a publication site with peer-reviewing. Its main feature is a series of pre- and post-publication peer reviewing processes. They are based on experience and knowledge gathered in traditional and digital academic publishing processes.

Subsequently, the traditional process of peer-reviewing is transformed into several new types preserving the traditional advantages as much as possible. In this variant it is possible to achieve speed without omitting the time-consuming peer review process by delaying peer reviews until after publication. This variant also offers the possibility of experimenting with different forms of quality assessment, e.g. an open and public (not anonymous) peer-review discussion.

The third type consists of pre-print and re-print open archive service. There are two functions which are particularly useful from the authors' point of view in this respect:

- Long-term preservation, including guarantees for permanent accessibility, readability, integrity and authenticity (with respect to the transition from one medium and/or format to another).
- Broadening of the readership by making the publications traceable via various Internet channels. Here, advanced methods of archiving and indexing play a crucial role, as do the options for self-ordering and ordering in knowledge domains. The use of the publications is further promoted by employing usual library tools in modernised form (such as user-friendly and accurate search engines, alerting and filtering systems and well-organised presentation of the publications on the web).

These types contain the main objective of the *Roquade* project: a gradual transition from less to more innovative solutions.

The generic part of the project is a subsidiary project that aims at a technical and organisational infrastructure common for all satellite projects. This core project generates for all the different types of publications the tools, services and know-how. They all have a modular structure, so it is not necessary to use the whole range of services and tools.

## 2.2 The phases of the project

In the project the following phases can be distinguished.

1. The preparation phase (May 1999– July 2000)
2. The start-up phase (September 2000 – December 2001)
  - a. Setting up the generic infrastructure for various publication variants
  - b. Satellite for each publication variant
  - c. Financing
  - d. Evaluation
3. The development phase (January – July 2002)  
The objective of this phase is to adapt and further expand the organisation on the basis of the experience acquired in the satellite projects.
4. Expansion phase (July – December 2002)  
The objective of this phase is scale enlargement of available publications and the audience.

At this moment the project is in its start-up phase, in which the infrastructure is being built and tested in satellite projects.

## 3. Roquade: the first results

The current *Roquade* satellites are:

- Electronic substitution for traditional publishing:
  - Scientific Journals:
    - *International Journal of Integrated Care*
    - *International Shipbuilding Progress*
    - *European Journal of Transport and Infrastructure Research*
    - *Kronos - Journal of Cape History*
    - *Veterinary Sciences Tomorrow*
    - *Ars Disputandi*
    - *Ancient Narrative*
    - *Neerlandistiek.nl (Dutch Philology)*
    - *Cahiers voor Geschiedenis en Informatica (Journal of History and Computer Sciences)*
  - Journals in co-publishing
    - *Pedagogiek (Pedagogy)*
    - *Tijdschrift voor Hoger Onderwijs (Journal for Higher Education)*
    - *The Veterinary Quarterly*
  - Dissertations:
    - *LOT Dissertations (PhDs from The Netherlands Graduate School of Linguistics)*
  - Grey Literature:
    - *Newsletter Historia & Informatica*
    - *Unitwin Series for Namibia*
- Publication site with experimental peer review systems:
  - *Design Research Internet Magazine*
  - *Interactive Publication: European Journal of Transport and Infrastructure Research*
  - *Syntactic Microvariation*
- Open archives:
  - *Institutional open archive in Law (Utrecht University)*

The core of the Roquade project: a technical and organisational infrastructure common for all satellite projects has a modular structure. The components are at this moment, during the project phase, divided as follows:

- author management concerns the communication with (and between) authors and editorial boards. This module concerns the complex of rules, conditions, requirements and tools that are at the disposal of author and/or editorial board during the production and sending-in of an electronic article (with possible appendices or attachments).
- editorial workflow. It concerns rules, conditions and requirements, as well as the choice or construction of tools for publishing and peer review processes sec.
- progress administration concerns the administration (and a supporting system or tool) of all activities that need to be carried out from the moment that an article is sent in for publication to its technical processing, including the persons responsible for these actions.
- storage, archive and distribution module refers to the tools and services regarding the process phases from processing the final editorial product (including metadata) to medium-neutral storage as well as selection and extracting medium-neutrally stored information for processing into final product(s).
- website module refers to the producing of various models and templates for optimal layout as well as functionalities of diverse types of online publications.
- customer relationship management module refers to the management (and a supporting system or tool) of contacts with the authors, editors, peer reviewers and readers of electronic publications.
- marketing module concerns the relation with (potential) readers and authors. It mainly focuses on promoting *Roquade* publications via various new e-marketing methods and channels.
- support module regards instructions for using services and tools that have been developed in other modules.

This division into components is based on a pragmatic division in assignment of activities to the project partners. It does not yet reflect the exact division of the definite modular products and services of *Roquade* after the project stage. This division will be based on an already initiated survey scanning the needs of authors and editorial boards.

During this project stage, the most important, tested and transferable results are:

- a storage, archive and distribution module: an XML-based semi-automatic conversion system. The input is a publication (at this moment only in MSword, later also in other text and media formats) manual provided with various structure- and meta-data codes. The meta data concern both disclosure and information in view of long term preservation.  
This publication is automatically converted into XML and then automatically inserted into the corresponding style sheet that publishes it on-line:
  - in HTML for on-line reading
  - and PDF for printing-and-binding-on-demand option.
- website module: model and tools for ergonomical lay-out and functionality for an e-journal, an e-dissertation and an institutional open archive. This model is based on user surveys as well as web publications analysis.
- marketing module: a checklist and instruction set for e-marketing methods and channels.

Co-ordinating the exchange of information, experiences and feed-back is the task of the co-ordinating front office. The front offices collaboration could be seen as a network organisation.

The organisational structure can be represented as follows.

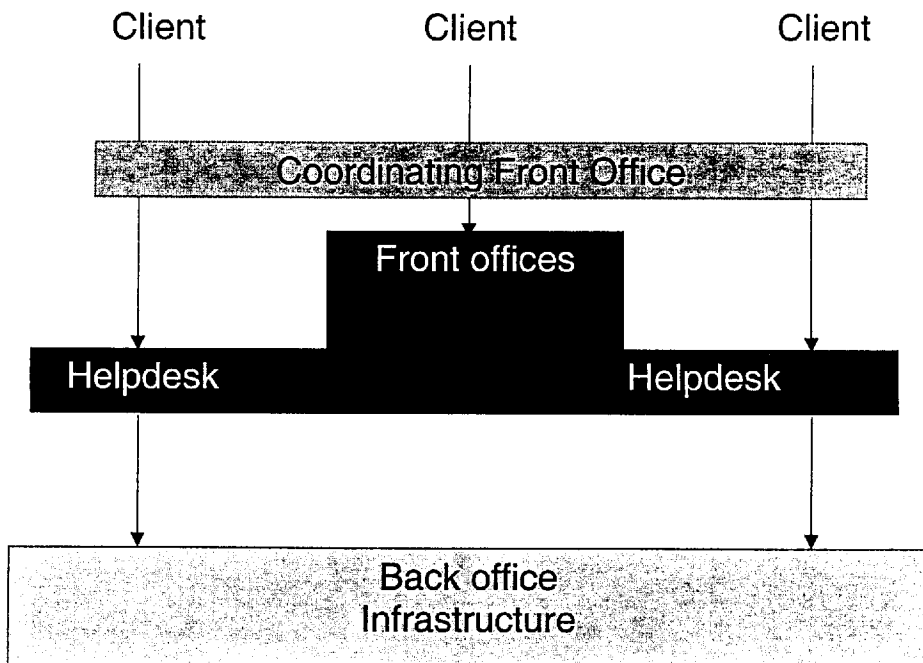


fig. 1: organisational structure

## 5. Concluding remarks

The experiences with the *Roquade* project thus far show that there is a new and real challenge for university libraries to become engaged in the support of electronic publishing. It is a true challenge because projects like *Roquade* are not initiated solely on the basis of a strategic analysis by the library management. They have reason for existence because scientists within our universities appeal to the library asking for support and assistance in making a successful transition to electronic publishing and new publishing models.

It is difficult to predict the future for academic publishing. Furthermore, we would be short-sighted if we were to prescribe a standard for what the future should look like. Therefore, it would be unmindful to impose a preferred model onto scientific communication. The academic community should initiate the flexible facilitation of new structures in scientific information processes that are advantageous to the academic



community itself. *Roquade* is an initiative that has this ambition. It holds benefits for the academic community as well as for the libraries that take the initiative.

Its benefits for the academics (both authors and readers) can be summarised as follows:

- Rapidity
- Quality
- Transparency of the reviewing and publishing process
- Positive attitude of scientists towards digital publishing
- Technological innovation
- Fair price
- Usage statistics

The benefits for the library are:

- Opportunities for applying gained experience of digital publishing and for exploiting the existing infrastructure in order to support the information and communication requirements of researchers.
- Better position in negotiations with publishers active in all fields in order to slow down the rising of subscription rates as well as improving financial benefits for the academic community in the long run.
- International co-operation.

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