*The Rembrandt Database*
**Inter-institutional Research Resource on Paintings by Rembrandt**


A pilot project of the Netherlands Institute for Art History (RKD) and the Royal Picture Gallery Mauritshuis in The Hague, funded by the Andrew W. Mellon Foundation as part of a larger initiative to create new digital assets that interface with those of other institutions and to foster international collaboration and the sharing of information and expertise.

Wietske Donkersloot, February 2009


**Introduction**
The Pilot Project was launched in March 2008 and is expected to be completed in August 2010. Thereafter, the goal is to further develop it as an ever-changing and growing research resource on Rembrandt incorporating conservation, technical, and art-historical information from multiple institutions and serving as an independent, collaborative, multi-lingual tool to advance the fields of conservation and art history.

The point of departure for developing this resource is the already existing extensive network of RKD databases of artists, works of art, literature and technical documentation that will be adapted and expanded. The information from these RKD databases and digitized documentation files will be presented through the website www.rembrandtdatabase.org (.com/.net/.eu/.nl). Conservation and technical documentation, scientific data and art historical information will be integrated for dissemination at different levels of interpretation.

**Database contents**
The pilot will include a test group of nineteen paintings by or (formerly) attributed to Rembrandt in the collection of the Mauritshuis. In the last ten years the most important works in this group, including Rembrandt's *Anatomy Lesson of Dr Nicolaes Tulp* (1632), *Homer* (1663) and the late *Self portrait* (1669), have been treated and thoroughly investigated with a range of technologies, generating new insights, documentation, and analytical data. This material (images and searchable text files) will be incorporated, in the database, together with documentation on the cross sections from all the Mauritshuis Rembrandt paintings. The database will be expanded by the inclusion of similar documentation on a selection of Rembrandt paintings from other important collections (initially The Metropolitan Museum, The National Gallery London, and the Louvre), as well as associated documentation from the archives of the Rembrandt Research Project. All information in the database will be presented in English, as well as in the national language of the contributing institution.

**Digitization and long-term storage**
All analog conservation and technical documentation will be digitized within the scope of the pilot project for preservation purposes. The *Rembrandt Database* will present a selection of this documentation online, while a complete set of digital files for each painting (including raw material) would be kept in long-term storage. Digitization of the analog documentation in the Mauritshuis will be carried out by the photographic department of the RKD and by an outside (Dutch) company with experience in the cultural heritage sector. Advised by the photographic department, new high resolution photographs of the paint cross sections will be taken by the scientists who analyzed the samples. Following the recommendations of a Mellon-funded committee on the digitization of x-rays, and those of other experts, a proposal for scanning the x-radiographic documentation from the Mauritshuis is currently being drawn up. Before storing the material and presenting it in the database, all born-digital

and digitized files will be checked and if necessary edited/assembled by the photographic department. An important aspect of the project is the long-term sustainable storage of digital files in high resolution. First steps have been taken to establish this facility at the RKD and to develop a digital infrastructure to enable the retrieval of stored files. Digitization of analog documentation of partner institutions outside the Netherlands will be carried out by them in-house or by outside organizations such as NEDCC. For all material that has yet to be digitized, the RKD and the Mauritshuis will offer guidelines based on existing procedures for large-scale digitization projects in the cultural heritage field in the Netherlands and abroad.

## User interface development

A comprehensive outline for the user interface of the new *Rembrandt Database* has been developed by the project team, describing the desired structure, functionalities and layout of the resource. This outline includes functionalities for visual browsing/searching (free and/or controlled), text searching, sorting, filtering, comparing and zooming. A provisional version of the outline has been presented to conservators, curators and other colleagues, who gave feedback. After "Version 0" of the interface – which will include documentation for a small test group of three paintings – is launched (probably in April 2009), extensive testing with potential users will be undertaken, and further feedback will assist the development of "Version 1", which is intended to include annotation tools, explanatory texts, summary descriptions (for both specialists and a broader audiences), and the capacity to download and print selected content.

## Database development

From the start the RKD and Mauritshuis were convinced that modification and amplification of the existing RKD databases would be more efficient and beneficial than creating an entirely new database for the Rembrandt pilot. The existing RKD database of Technical Documentation has already proven its suitability for storing and structuring metadata of conservation documentation on works of art from multiple institutions. Moreover, with the *Rembrandt Database* established as an integral part of its existing database infrastructure, the RKD will be able to take full responsibility for the maintenance and future expansion of this resource. Software for the existing databases has been developed by the RKD in close consultation with Adlib Information Systems. The custom-made software solutions are based on the application 'Adlib Museum' (used by many other institutions and museums, both in and outside the Netherlands). This flexible application for managing collections and information in museums supports full object documentation to Spectrum standards and follows the CIDOC Guidelines for Museum Object Information. The system can be run in multiple languages, and data entry is supported by validation files and thesaurus functionalities. Predefined thesauri such as the Art and Architecture Thesaurus (AAT), can be loaded into the system; data structures and screen layouts can be changed by the RKD; and core software updates are carried out by Adlib. Most current developments are being undertaken at the Microsoft.NET platform. All RKD databases are in an Adlib 'Native' flat file database, but they are currently being converted to Microsoft SQL Server 2005-based technology. Adlib applications can also run on MS SQL Server and Oracle. RKD web applications for the databases are based on XML, CSS and ASPX technology which can easily be adapted. Portal sites capable of searching remote databases can be constructed. Adlib supports OAI-MHP and search and retrieve web services SRU/SRW. Data can be imported and exported through tagged ASCII, delimited text, XML or in other ways, by special arrangement. Information in Adlib databases can be mapped to RDF-triples, the semantic framework used by the Raphael Project at the National Gallery in London.

The basic Adlib Museum application is subject to a license, but custom-made additions are not, and customization of the databases will be the result of input from both the RKD and Adlib. The RKD and the Mauritshuis fully endorse the guiding principle of the Mellon Foundation in stimulating the use of open source solutions in order to achieve the greatest possible scholarly and educational benefit.

Therefore, in agreement with Adlib, the user interface will be developed in such a way that widespread and cost-free use by the scholarly and educational communities will be safeguarded. Software developed within the project will not be commercially exploited and both data and applications will be interoperable. For certain features of their project, the RKD and Adlib are investigating the possibility of using open source solutions or developing certain components of their project in open source.

## Communication
RKD and Mauritshuis are eager to exchange experiences and expertise on the development of the *Rembrandt Database* with their international colleagues in order to make the results of the project as beneficial as possible for museums, scholars, and the broader public. The project team has discussed (or will in the coming months) the project with colleagues working on other Mellon-funded projects and on comparable initiatives in and outside the Netherlands. To make the *Rembrandt Database* more widely known and to get feedback on its proposed structure, content and functionalities, it will be presented during 2009 at the international conferences of AIC, ICOM-CC, CODART and the Rembrandt Conference at Herstmonceux organized by Queens University.

## Future plans and developments
During the pilot and thereafter, RKD and Mauritshuis will collaborate closely with the Metropolitan, the National Gallery London, the Louvre, C2RMF (and possibly the Gemäldegalerie Alte Meister in Dresden). A select number of the Rembrandt paintings in these four collections will be incorporated as test cases for the future incorporation of all their Rembrandt documentation. After completion of the pilot RKD is prepared to take full responsibility for the maintenance of the database, and the Mauritshuis (together with international partners) will assume responsibility for updating and expanding the data on their Rembrandt paintings on a regular basis. In the course of the pilot phase, RKD and Mauritshuis will actively approach other collections with important holdings of Rembrandt paintings. They will be kept informed about the progress of the pilot and will be invited to participate in follow-up projects to further expand the content. These projects would be coordinated by the RKD, and the Mauritshuis would serve in an advisory capacity. It is expected that additional museums will digitize (parts of) their conservation documentation and make the related art-historical information and files available online. Ideally, recorded data can be aggregated by others, making it possible to build multi-institutional online databases on subjects across collections and 'institutional boundaries' without having to rerecord the data. Protocols for such interactions already exist (such as the protocol developed by the Open Archives Initiative), but XML-standards will need to be better established and applied by the museum community. RKD and Mauritshuis will closely follow international developments in this direction and hope to gain a better understanding of the possibilities and the issues involved in data sharing through collaboration with its initial partners.

## Project team members
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