

Linked Art Provenance

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ABSTRACT

Provenance research has become a key practice in the field of art market studies. The growing number of datasets and digital services around art-historical information presents new opportunities for conducting provenance research at scale. Usage of these new sources is hampered by the heterogeneity of information, worsened by temporal and cultural differences in documentation practices and its current digital storage/processing. In this paper we propose 1) a workflow model able to integrate provenance information from various sources, 2) a method to combine information from both on- and offline sources about art objects and auctions. We validate this method through a case study, where we investigate whether we can capture information from selected sources about an auction (1804), during which the paintings from the former collection of Pieter Cornelis van Leyden (1732-1788) were dispersed. The heterogeneous information acquired through the model might potentially be saved in a homogeneous database that can be processed to a Linked Open Data format. The idea behind this is that all the data gathered from both the online and offline sources will be processed in the same format and can help extend the information of available databases. Furthermore, by automating certain important steps in the process of provenance research, we are able to contribute to the facilitation and acceleration of this process altogether. The workflow model also provides a basic guideline for provenance research and future integration with Linked Open Data process can lead to new potential for addressing relevant research questions for studies in the history of collecting and the art market.

Keywords

Cultural heritage; art markets; provenance; linked open data; knowledge acquisition

1. INTRODUCTION

The value of provenance research within the art-historical world has increasingly been recognized in recent decades. This specific type of research developed slowly from a sub-category within the art-historical world, and in particular within the art market, to a full-fledged research method or even a central topic of comprehensive studies. Although provenance research is part of art history, other disciplines are also closely associated with provenance studies, such as anthropology, sociology, economic history and cultural history. Furthermore, the importance of data science within the field of provenance research has become more apparent in recent art-historical literature. This increasing interest in the possibilities of combining art-historical and data-science research in provenance studies is also shown given the increasing availability of online databases with provenance information and

trails, such as ‘The Getty Provenance Index Databases’, that includes various forms of digitized archival information such as dealer stocks and sales catalogues. Also, the website of the Netherlands Institute for Art History (RKD) provides useful provenance information. Such databases are considered overall beneficial for research into the art market [8]. However, many of these databases form separate information sources and an extensive, reliable database that links different provenance information is lacking so far. Although data science within the art-historical research field is still poorly developed, it is not surprising that the demand for digital sources in this field is steadily growing [3,27].

One of the first things that we encountered during the interdisciplinary part of this project was that current art historical research increasingly uses digital sources. Moreover, more and more online databases are being created.¹ The corpus of this online knowledge forms nevertheless a heterogeneous whole. A possible explanation for this development is that there is still a lack of available online tools and resources to store and process art historical information in a homogeneous way. Besides that, most information is still only accessible through analogue sources that in some cases even have different information on the same object. This provides the starting point for the challenge of digitizing art historical information to combine and gather all the available information on objects. Linked Open Data is a form of structured data which is interlinked with other data and therefore provides a tool (online source) where heterogeneous information is combined to provide the most extensive knowledge on an object. The availability of machine-readable provenance in the form of Linked Data can offer many advantages for research into the (history of the) art market and into (the history of) collections, but it can be useful for the museum world as well. It can help to answer relevant art-historical research questions and topics concerning the art market. Consider, for example, the price development of a particular work of art over the years, the appreciation of a particular artist or art movement, but also: who bought what and why? Not only the provenance trail of a work of art is exposed with such a database, but it also provides insight into the connections and developments between buyers, sellers, artists and prizes. In order to explore the benefits of the contribution of a Linked Database to provenance research, the Linked Art Provenance (LAP) project has been established. The main goal of this project is to automate certain important manual steps in the process of provenance research and is built around the case of the collection of paintings of the prominent Leiden patrician Pieter Cornelis van Leyden (1713-1788). The print

¹ Some well-known examples are: [RKD Explore](#), [Ecartigo](#) and [the Getty databases](#). Besides that, many museums and art libraries have an online accessible collection catalogue nowadays, that is used by many art historians for their research.

collection of Van Leyden was inherited by his daughter, who sold it to Louis Napoleon (1778-1846), king of Holland, and came in possession of the Dutch state. It formed the foundation collection of the National Print Room in Amsterdam. Several publications have appeared about this print collection of Van Leyden. For example, the article of Niemeyer in 1983, in which he describes the prints of Van Leyden who formed the foundation of the Dutch National Print Collection [19]. In addition, the more recent article of Vermeulen argues that Baron van Leyden wanted to create an overview of European art with his print collection [26]. Despite the fact that the print collection is known as a whole, the corpus of the collection of paintings is rather unclear. This collection, consisting mostly of Dutch paintings from the seventeenth century, had after all dispersed widely after an auction of 1804 in Paris. A contemporary source about the collection is the French auction catalogue that provides an elaborate description of the artworks, sizes, the used medium and the painter² [1]. Besides that the *Rapenburgproject* has identified a part of the paintings from this collection in the 1980s. The large increase in digital sources since then would enable us to identify even more paintings and makes this a suitable case for the LAP project. In this way we can demonstrate the use of different online and digital sources in the search of the whereabouts of the unknown paintings. The, at least partly, automated process of provenance research could eventually be processed in a Linked Data format, in which various heterogeneous sources will be assembled in one homogeneous database. Ideally by usage of Linked Data, this long-lost collection of 115 paintings with its corresponding provenance trail could ultimately be mapped. This will not only shed light on the preferences of the collector van Leyden, and the nature of his collection, but also on the circumstances of the auction in 1804.

In this article we will present a data model that allows combining provenance and other art historical data from heterogeneous sources. But more importantly, it includes certain automated processes as well. However, due to the scale of the project and the amount of dispersed paintings in the Van Leyden collection, we were not able to identify all the paintings. The paintings that are identified by us and that are not mentioned in the *Rapenburgproject* can be found in appendix B. In order to illustrate the future possibilities of the model and its benefit for the art historical field, two cases are included in this paper. The cases therefore function as a validation of the data model. *The Lace Maker* (1662) by Caspar Netscher (1639-1684), lot nr. 67 in the 1804 auction (Figure 1) provides us a suitable case to present the possibilities of the Linked Database, because of its extensively-known provenance that is accessible through various recognised sources. *An Italianate Evening Landscape* (1650) by Jan Both (c. 1618/22-1652) is a relevant case to demonstrate the possibilities of adding digitized steps to the process of provenance research, since this painting had not been identified by the authors of the *Rapenburgproject* (Figure 2).



Figure 1. Caspar Netscher, *The Lacemaker*, 1662, oil on canvas, 33 x 27 cm, London: The Wallace Collection, inv.: P237.



Figure 2. Jan Both, *An Italianate Evening Landscape*, 1650, oil on canvas, 138,5 x 127,2 cm, Washington: National Gallery of Art, inv.: 2000.91.1

² The Lugt number corresponds to a certain art sale that is included in the *Répertoire des Catalogues de Ventés Publiques* by Frits Lugt in 1937-1987. For some decades now, this has been one of the most widely consulted art historical reference work that lists more than 100.000 art sales catalogues from libraries in both Europe and the USA, covering the period of 1600 to 1925.

2. RELATED WORK

In order to position the LAP project within the current field of research, it is important to outline a brief overview of the recent literature considering both provenance research and Linked Data.

2.1 Provenance Research

Provenance research was and still is primarily an activity of experts in the art market and of advisors, collectors and curators, who are closely involved in the transfer of art objects in cases of sale or acquisition. Authors of oeuvre and collection catalogues often do profound provenance research for their publications as well. In this respect, provenance research often results in a list of former owners of an artwork. In many cases, provenance has produced such interesting art-historical data that provenance research gradually became increasingly endorsed within the art-historical field.

In the first place, a growing interest in patronage and collecting can be noted, two components of the art world that are in many ways in interface with the study of provenance. This increasing concern for the history of collecting started at the beginning of the twentieth century, when classificatory tools, such as Frits Lugt's monumental dictionary of marks on drawings and prints *Les marques de collections de dessins & estampes*, came into being. The provenance of an artwork remained nevertheless subordinate within the research of collecting [28, pp. 1-2].

During the last quarter of the twentieth century and the beginning of the twenty first century Nazi-looted and ethnographical art caused, and still causes, a growing demand for provenance specialists in the museum world. Moreover, special guides to help people conduct such research were published. An example of a substantive analysis of provenance research is Yeide'a, Akinsha's and Walsh's *The AAM Guide to Provenance Research* [28]. In recent years, there has been a slight increase in scientific literature on provenance research as a research methodology and as a specific field of study. In most cases this mainly concerns the value of provenance research for studies on the art market, as is evident from the publication of Tom McNulty, *Art Market Research: A guide to methods and sources*, from 2006 [18]. Another example of this increasing interest in provenance research are organized conferences that focus on provenance as a main theme, such as the one held in 2004 in Paris, that resulted in a book "The Circulation of Works of Art in the Revolutionary Era 1789-1848" [20]. The publication mainly considers works of art that changed hands as a direct consequence of revolution and other political and economic upheavals. Three years later another conference in Rome resulted in the 2011 publication *Sacred Possessions: Collecting Italian Religious Art, 1500-1900*, in which the effects of passage of time and changing ownership on the reception of religious art in the history of collecting was investigated [7]. These conferences and associated publications indicate an increasing interest in the history of collecting and provenance of several works of art. Provenance research was considered as an important tool within the art historical field, but not an end in itself.

Contrary to the studies discussed above, the recent article by Gramlich, *Reflections on provenance research: values-and-markets*, published in 2017, gives a more extensive analysis of the links between provenance research and research into the art market [8]. This article elaborately describes the historiography of provenance research and emphasizes how provenance research can contribute as a methodology to art market studies. The

importance of digital databases is mentioned in particular [8]. The most extensive and prominent publication in the field of provenance research, which also accords a major role to the interdisciplinarity of the research field, is Provenance an alternate history of art from 2012 by Feigenbaum and Reist [6]. It was compiled on the occasion of a session on provenance at the College Art Association's annual conference in 2008. In this book, the authors discuss in detail the possibilities that the broadening of the research field of provenance research entail. However, the use of data science for art history considering provenance has not been investigated [6, pp. 1-2].

2.2 Linked Data for Digital Heritage

As mentioned in the introduction there is a lot of potential on bridging the gap between analogue art historical information and getting it digitized, through Linked Open Data. This is however not as simple as it sounds and the question asked by Drucker (2013) provides a solid basis for our project: "How and in what ways can digital techniques offer fundamentally innovative or useful insights to the discipline of art history?" [3]. Drucker (2013) explained that there are a lot of unique challenges on the matter of digitizing art historical information. There is for example only a slight rise of available online tools for the processing of this information. She mentioned that at least the following tools are necessary: repository development, database creation, metadata enhancement, provenance studies, visual or cultural analytics, and new approaches to curating and publishing [3]. Another aspect that is mentioned is the idea that art historians and other humanists have to be more aware and accept the idea of digital tools and models of knowledge in their field of research. After they realise that these tools and models potentially have great benefits for the future of art history, it is easier to convince them to not solely rely on analogue sources.

Therefore we provide a model of knowledge acquisition (see Section 3) that bridges between the gap to gather, process and present art historical information as Linked open Data. The growing number of datasets and digital services around art-historical information present new opportunities for conducting provenance research at scale. This statement is backed by Lincoln (2017): "The growing number of datasets and digital services around art-historical information present new opportunities for automating a significant part of provenance research at scale." In our case, we are interested in the information related to an artwork, its provenance trail and where each piece of information about the artworks and its provenance originated from. Currently most of this information is gathered in a manual manner and is then written down instead of acquiring and sharing the knowledge online. A lot of knowledge is lost when the manual steps are not shared or even digitized by the art historical expert. Dijkshoorn et al. applied the concept of Linked Data to the Rijksmuseum collection and structured vocabularies. They stated that by allowing datasets to be available for other institutes, it can enrich their own database due to cross-referencing, interlinking and integration of more (relevant) information [30]. Although this sounds promising, Dijkshoorn et al. still noticed that only a few institutes publish and integrate Linked Data. As an extension to the article mentioned above, Kuhnen et al. investigated available provenance models by checking existing Web standards and cultural heritage practices on provenance [16]. They found that, due to the use of different available provenance options the records became inconsistent and some records still even lack of information. Kuhnen et al. opted for the use of the W3C PROV model, that is currently used in in the domain of cultural heritage to model the provenance in terms of the

acquisitions and agents linked to their ownership and location [16]. This model currently provides the artwork provenance information for the Rijksmuseum in an efficient and queryable fashion. Although the W3C PROV currently is being used by the Rijksmuseum as mentioned by Kuhnen et al. (2018), we intend to use the CIDOC Conceptual Reference Model (CRM) for our models on Linked Open Data, that is currently being used by the British Museum. That museum was the first UK arts organisation to publish its collection semantically: “The CIDOC CRM provides definitions and a formal structure for describing the implicit and explicit concepts and relationships used in cultural heritage documentation.”³ By doing so, it is possible to search nearly 2 million object records published on the website of the British Museum, a third of which currently includes at least one digital image. Along with an extensive documentation, the CIDOC CRM provides all the needed tools to create the provenance database to enrich the cultural heritage information on the Semantic Web.

Specific literature that deals with the interdisciplinary links and advantages of art-historical provenance research and data science has, however, not been published yet. Our research project provides a model for knowledge acquisition that showcases automated and digitizing steps to assist the art historical expert during their provenance research. In a later phase and the potential end result of the gathered information, we may present first steps into showing how a Linked Data model can contribute to answering relevant art-historical research questions.

3. METHODOLOGY

The goal of the LAP project is to create a workflow model that is able to combine and integrate heterogeneous information from different, on- and offline sources. By automating certain important steps in the process of provenance research, it will be possible to facilitate and accelerate this process altogether. Besides that, the workflow model also provides a basic guideline for provenance research and together with the proposed Linked Open Data process can possibly answer relevant research questions for art market and collection history studies.

In this paper, a lot of the art-historical information is manually processed. This has to do with the fact that many valuable sources have so far not been digitized. Besides this, the practice of identifying a painting and interpreting historical sources demands the knowledge and skills of an expert. To acquire the homogeneous integration of information, our aim is to automate as many processes of the provided steps that are done by the art historical expert as possible. The steps that are done during provenance research by the art historical expert and the provided automated and digitizing additions are provided in Figure 3.

3.1 The provenance model

To find out where possible steps in the process of provenance research can be automated, it is necessary to outline all the steps taken in the search of the provenance trail of a painting. To do so it is important that the existing literature concerning provenance studies is taken into account. The most useful source for

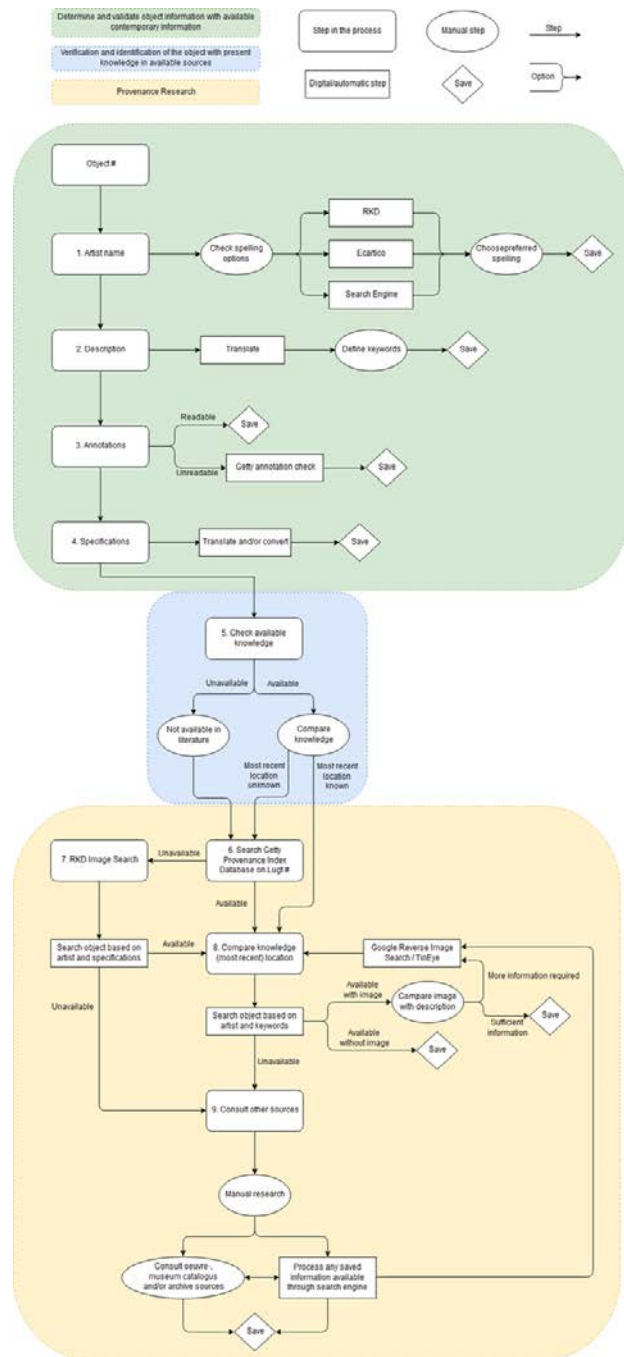


Figure 3. Workflow model of the LAP Project.

validating the method of research is ‘The AAM guide to provenance research’ [28]. According to the AAM guide there are several basic principles considering provenance research. The most important information that is needed in order to create a complete provenance trail are the names of the owners, places and dates of ownership and the methods of transfer between owners. Furthermore the guide provides several steps that can be taken to form a logical procedure in provenance research. The first step concerns the object itself. In this step it is important to investigate all the details about a certain object of art. The backs of paintings are in particular of great importance in this matter, since these contain in many cases dealer or collector marks. These can

³ [CIDOC CRM website](http://www.cidoc-crm.org/)

provide significant clues for tracing back the provenance history. The second step is investigating institutional files, such as curatorial or donor files. As is demonstrated by this example, the AAM guide focuses mainly on provenance research of artworks preserved in museums. After doing this, the following phase is, according to the guide, library research. The literary sources that are consulted can not only be used in search of more provenance information about the object itself but can also be helpful in gaining more information about the painter and the collectors that have owned the art object. Besides published sources, the guide also underlines the importance of photo archives. Various online sources that can be useful in provenance research, such as the Getty Provenance Index Database, are listed in the guide as well.

Although the AAM Guide provides quite an elaborate phased plan to reveal the provenance of an art object, its method and purpose differs to a large extent from those of the LAP project. Provenance research often departs from an existing art object, whose provenance history must be found. However in the case of the LAP project, the intention is to plot the provenance trail from a certain event in provenance history, namely the auction of the Van Leyden collection in 1804. Eventually this could lead to the identification and current location of paintings from the former collection of Van Leyden, which are for a large part unknown so far.⁴ Therefore the auction catalogue of 1804 forms the basis of the identification process of the long-lost paintings in the Van Leyden collection. Because of this approach, it is hard to rely on existing sources considering provenance research that mainly focus on object based research, when outlining these manual actions in a step-by-step plan. The provenance research in context of the LAP project serves the reconstruction of an art collection from the past, and is therefore an example of collecting history.

In order to create a validated scheme of the manual steps of provenance research that also complies with the working method of art historical researchers in the field, we interviewed various provenance researchers and collecting historians.⁵ With their involvement we were able to create a practical scheme of all the steps taken in the process of provenance research of the LAP project (see Figure 4). In this blueprint of the manual research method, we derived possible options where these manual steps can be digitized and/or automated.

As visible in the model, the starting point of the identification process of the Van Leyden paintings is a certain painting in the auction catalogue. Since there are three different Lugt numbers connected to this specific auction, we had to choose one of them. The most recent copy of the catalogue was the one with the corresponding Lugt number 6864. A copy of this catalogue is preserved in the library of the Netherlands Institute of Art History (RKD). It not only lists the paintings from the Van Leyden collection, but also contains handwritten annotations in the margins. Because annotations like these may provide information about the buyer and price of the paintings, they are considered important for art-historical research into collecting or the art market [16]. There are, however, several other annotated

auction catalogues available in various archives.⁶ One of the reasons for choosing the RKD copy with the Lugt number 6864, besides the fact that it was the latest version of the auction catalogue that had been adjusted for three times, is that the name of the owner of the catalogue, P.F. de Goesin Verhaeghe, is written on the cover of the catalogue (see Figure 4). The name can be identified with Pi re Fran ois Antoine de Goesin-Verhaeghe (Gent 1753-1831), who was a painter from the Southern-Netherlands. In the annotations he made during the auction, he mentioned the sale of lots to residents of the city of Gent, which implies that he might have known these people and was in fact the painter De Goesin-Verhaeghe. In art historical research annotated catalogues of which the owner is known are considered most valuable.

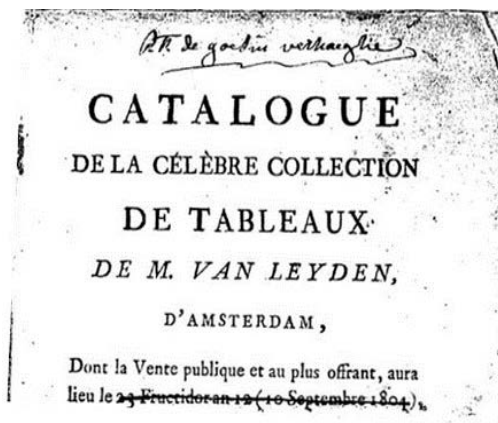


Figure 4. Catalogue de la c l bre collection de tableaux de m. Van Leyden, d'Amsterdam, (Lugt nr.: 6864, available at RKD, The Hague), front page with the name of the owner of the auction catalogue in handwriting.

The auction catalogue listed 115 paintings, all alphabetically ordered by last name of the painter and numbered from 1 to 115. As shown in Figure 5, every entry in the catalogue starts with the name of the painter and the object data such as medium and dimensions. Then follows an elaborate description of the painting, which had the function of a visual evocation, because it was not yet a custom to publish images in auction catalogues. All the information that derived from the catalogue was entered in an Excel file by hand. All the pages had to be individually photographed after which Optical Character Recognition (OCR) could be applied.⁷ This was done as preparation for the data to be processed in the workflow model. The first phase (see step 1-4 of Figure 2) in the provenance research model is to determine and validate object information with available contemporary information. Since the catalogue is a historical document, written in French, it is necessary to validate certain information listed in

⁴ 36 of the 115 paintings in the Van Leyden collection have been identified in the *Rapenburgproject* [22].

⁵ The people that were involved in creating the manual step-by-step plan of the provenance research of the LAP project are: Everhard Korthals-Altes [11,22,13,14,15], Huigen Leeftang, Eddy Schavemaker, Perry Schrier and Ingrid Vermeulen [26].

⁶ Annotated copies of the auction catalogue can for certain be found in the following collections: Germany: BMP (prices and names); Belgium: MB (prices and names), LRB (prices, names and other annotations); Austria: AKW (prices and names); Great-Britain: BMPL (several prices and names), VAL (several prices); the Netherlands: RKD (2 copies with prices and names); Italy: IAR (prices and names). This information can be found on [the Brill website](#), that provides online auction catalogues.

⁷ Due to the vulnerability of the original auction catalogue, scanning the document was not permitted.

the catalogue, such as the supposed name of the painter, the dimensions and the used medium.

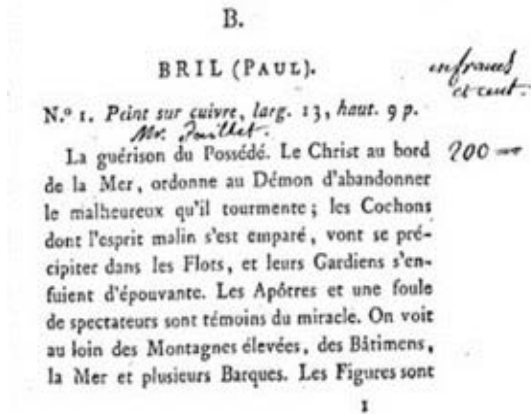


Figure 5. Catalogue de la célèbre collection de tableaux de m. Van Leyden, d'Amsterdam. (Lugt nr.: 6864, available at RKD, The Hague), 1804, p. 1.

The first step in the workflow model is to check the name of the artist for different spelling variants on different sources. After that, a preferred spelling is being chosen and saved for later steps in the process. In the second step, the description of the painting is the most important component. The description has to be translated into English and certain keywords have to be selected that will be saved for later use. Besides this, the annotations entail important information, which helps the completion of the provenance trail and research into art market or collecting, since they contain in most cases the name of buyer and the price that has been paid for the painting. After checking the annotations (step 3) in the Getty Provenance Index, this information can be saved for the completion of the provenance trail of an object. It can also be used for valuable information such as developments in the reception of seventeenth century art and the art market. Finally, the specifications of the painting (step 4), should be translated and converted to standard dimensions. The conversion of the dimensions to a desired format was based on a document with validated conversions of old dimensions provided by Eddy Schavemaker, one of the experts mentioned in the former paragraph.

The next phase in the model concerns the verification and identification of the objects with present knowledge in available sources. Step 5 of the workflow model comprises the consultation of the available literature on the Van Leyden painting collection. The most important publications in this case are the *Rapenburgproject* [22] and *Revolutionary Paris and the Market for Netherlandish Art* [24]. In some cases, the identified painting and its most recent location are mentioned in these publications. When this is the case the stated information must be checked, in order to confirm the attribution.

However, not all paintings have been identified in existing research into the Van Leyden collection or the 1804 auction in which the Van Leyden paintings were sold. So when the completed phases 1 and 2 do not have a certain outcome, regarding the identification of the painting and its most current location, we have to turn to phase 3 in the model. This third section in the model concerns the actual provenance research. When the most recent location is still unknown the first thing to do is searching the Getty Provenance Index Database on the corresponding Lugt number, step 6 of the model. The Getty

Provenance Index Database contains a comprehensive Sales Catalogue Database, in which the Van Leyden auction of 1804 has been included. In some cases, a current location of the painting has been registered. When that is the case, again, one has to verify the results of the Getty Database, by checking the website of the most recent location of the painting. When an image is available, this has to be compared with the description of the painting in the auction catalogue in order to confirm the identification of the painting stated by the Getty Database. The problem is that the Getty Database does not always state the location of a painting. Nevertheless, the first buyer is often mentioned, based on the annotations in the catalogue. Consulting the Getty Database therefore often provides an intermediate step in the research of the provenance trail. In search of the identification and thus also the recent location of the painting, other sources need to be consulted. When the Getty Database does not provide any results, one has to turn to the tool on the RKD website called the RKD Image Search (step 7). With this tool a certain painting can be searched on the basis of the name of the artist and the specifications of the painting. When the painting is available one returns again to step 8, in which the knowledge that we so far have is compared with the information available at the website of the most current location, as can be seen in the workflow model. When the painting cannot be identified by means of the RKD database or any of the other provided methods, the next step (9) will be searching either analogue or digital sources. However, in practice this will in fact most of the time be done simultaneously. If necessary, Google Reverse Image Search can be used in this step as well, in order to provide additional information about the painting and its provenance trail. All the provided and extracted information will be saved for later digital use and potentially processed towards a Linked Open Data format.

3.2 Digital and automated steps

As was discussed in the previous section(s), there is a lot of potential benefits to digitizing and automating certain steps of the steps in the workflow model that is done by the art historical expert. Each of the steps are proposed to work as separate tools so that our chosen process is not fixed and might be adjusted to the needs of other researchers.

An example of an automated step was the conversion of the photographed pages of the auction catalogue to text by using the OCR. To enhance the accuracy, all the pages were manually checked for correctness. Nevertheless the OCR method provided a much faster, and in some way automated, process then manual typing everything straight from the auction catalogue and equips us with the first automated tool to computerize the process of filling a database with useful information from real world sources.⁹ During step 1 through 4 of the workflow model where the goal is to determine and validate object information with available contemporary information, there are additional steps that can be automated. In the first step the name of the artist is manually checked on different websites. The chosen online sources (RKD, Ecartico and any search engine) are mostly a fixed choice and can be put in a tool which scans for the possible naming variations of the artist. As a follow-up in step 2 to the French origin of the catalogue and name spelling, the original French description of the paintings was translated into English

⁹ In a later phase, we tend to gather information from the same catalogue from different digital sources to enrich our database, but that might be out of the scope of this paper.

and Dutch using the Google Translate function¹⁰. The latter was done so that we can better determine keywords for eventual search strategies, since the knowledge and understanding of the French language is not our strong suit. The errors that may arise from automatic translation is known, but same as the OCR method, the Google Translation provides a fast and fairly accurate (automatic) step to accomplish this. Nevertheless, an art-historical expert will always have to check the translations for possible misinterpretations of art-historical terms. The third step of the first phase is that of acquiring annotations from the auction catalogue, which remains a manual step, since OCR will not provide a solution here. This is due the fact that annotations mostly are handwritten notes, that again are better interpreted by the art historical expert. To complete the gathering of available information of the object (phase 1), the used material and dimensions of the object are automatically translated and converted to the desired format in step 4 based on the input.

Phase 2 of the workflow model currently did not present options that could be automated. In phase 3 (step 6-9), some more potential automation and digitizing steps arise. After the current acquired knowledge (phase 1) is compared to available analogue sources in phase 2 along with a identified location of the object, we can access potential new online sources. These new online sources can provides us new information to expand the acquired heterogeneous information even further. In some cases the Google Reverse Image Search or TinEye as shown the model as a side step of step 8, provides a useful tool in order to gain more information about the painting. This will sometimes even provide missing parts of the provenance trail. That can be the case when the most current location of a painting is for example the online catalogue of an auction. By searching on the basis of the image of the painting, it is sometimes possible to find the current location, at least when it is part of a public collection. The fact that the Google Reverse Image Search tool provided positive unexpected results in some instances, is a reason why it should not be overlooked in the process of provenance research.

4. PIETER CORNELIS VAN LEYDEN

The central case of the LAP project is, as mentioned before, the painting collection of Pieter Cornelis van Leyden (1717-1788). This well-off eighteenth-century patrician had built up a significant art collection over the years, which was passed on after his death to his son Diederik van Leyden (1744-1810). After it became his property, the paintings completely dispersed at an auction in 1804 in Paris. The only source that is left about the 115 mostly Dutch seventeenth-century paintings is the auction catalogue [1]. The catalogue mentioned Paillet and Delaroche as auctioneers, and was registered with the following Lugt numbers: 6841, 6852 and 6864. It is remarkable that there are in fact three corresponding Lugt numbers connected to this specific auction. The different numbers are a result of the changing dates on which the auction was supposed to be held. Lugt number 6841 corresponds to 5-8 July 1804, 6852 concerns the rescheduled dates 10-13 October 1804 and eventually the auction was held on 5-7 November 1804 with 6864 as a related Lugt number. The reason for the rescheduling of the auction has not been discovered so far. It could have had to do with the fact that the organization was not in place or that the auctioneers hoped for a better turnout

if they moved the auction to new dates. We do know that with the rescheduling of the auction, two supplements were added: one consisting of old masters that were unrelated to the Van Leyden collection, the other containing mostly precious stones. All the separate Lugt numbers and events with corresponding time and place will be included in the database. The authors of the *Rapenburgproject* managed to identificate 36 paintings¹¹ [22]. Considering the fact that in the time of publication virtually no art-historical sources were available online, new research with the help of digital means will very probably lead to more attributions. Other attempts to identify the paintings have not been undertaken yet.

The auction of the Van Leyden collection in 1804 has recently been investigated by Spieth, *Revolutionary Paris and the market for Netherlandish art* (2017). Some pages of the book are completely devoted to the nineteenth-century auction of the Van Leyden collection [24]. According to Spieth, Alexander Joseph Paillet was auctioneer of the sale, as well as partly owner of the paintings by the time they were auctioned. This had to do with a consortium, led by Paillet, that bought the painting collection as a whole from Diederik van Leyden for 100.000 guilders, approximately 224.000 francs, before the relevant auction of the works of art took place. The other two members of the consortium were Louis-Bernard Coclers, a painter and art dealer from the Southern Netherlands, and Égide de Lespinasse de Langeac, inter alia an art connoisseur. Both of them were thus influential figures on the Parisian art market. Partnerships like these were not uncommon in Paris at the beginning of the nineteenth century. Spieth explains that Diederik van Leyden probably decided to sell his works of art and to auction them in Paris, because the French occupation made sale in London impossible. Besides that, he suggests that Van Leyden was at that time in financial hardship and was therefore probably forced to sell his belongings. Parisian art dealers were often closely involved with the liquidation of art collections¹² [24].

During the auction, prices were in fact quite driven up by Paillet and Delaroche, who as auctioneers were also bidding. Although it is unclear whether they bid for themselves or as a commission. There are in fact 62 lots repurchased in this way, including the most expensive painting in the auction A Hermit Praying Among Ruins attributed to Gerard Dou. Paillet bought this painting for himself for the sum of 42.000 francs. Because of the serious

¹¹ For the titles of the paintings see: [22], pp. 518-533.

¹² Furthermore, Spieth states that Van Leyden was forced to sell the beloved paintings of his father. This is very unlikely. The wife of Diederik van Leyden, Aletta Gael, died in 1803 and left him a douarie of 40.000 guilders, half of the household effects, pieces of land in Vlaardingen and the usufruct of her possessions. The larger part of her capital went to her brother Johan Gael, who received 365.000 guilders. Diederik started buying property in and outside of Amsterdam, including a country estate in Vechtwijk in 1805. A lack of money would play hardly any role in Diederik's decision to sell his father's paintings. There was probably no question of other pressure either, since the fact that Diederik received a high price for the collection - assumable more than it was actually worth considering the eventual revenue of the auction. So, the most likely reason for the sale was probably the high sum of 100.000 guilders that the dealers offered, which was too attractive not to accept. That Van Leyden made a good deal derives from the fact that the paintings would sell for much lower prices than the consortium paid for it, on the actual auction.

¹⁰ The Google Translate function was chosen due to its free capabilities and high review ratings for its fast and accuracy process of translation.

doubts of the attribution to Dou, the painting was still in his possession when he died and was sold for a less higher price, 15.000 francs to be precise, by his son. Dou had done many paintings of a Hermit sitting against a ruin background and the Van Leyden panel was one of several exceedingly skilled variations on this theme. Since Spieth's publication mainly focuses on the art market for Netherlandish art in revolutionary Paris, the identification of the Van Leyden paintings was not the principal goal of his research. He therefore does not focus on any provenance trail or possible identification of the Van Leyden paintings. The only exception is the Ratification of the Peace of Münster between Spain and the Dutch Republic by Gerard ter Borch (see Figure 6). This painting was however already identified in the publication of the *Rapenburgproject*.



Figure 6. Gerard ter Borch, Ratification of the Peace of Münster between Spain and the Dutch Republic, 15 May 1648, 1648, oil on copper, 45,4 x 58,5 cm. London: The National Gallery, inv.: NG896.

5. CASE STUDY IMPLEMENTATION

To demonstrate how the discussed provenance research model is applied based on the described manual and digital/automated steps, we use two case studies of artworks in the Van Leyden collection. By using two different cases, it is possible to show the various ways in which the workflow model can be used. The first example will be the *Lace Maker*, a painting with a well-known and extended provenance trail. The second one, *An Italianate Evening Landscape*, will show the possibilities of the model regarding the identification of a painting by solely analogue sources is challenging. (See appendix A for the results of various pipelines following the steps of the workflow model).

5.1 The Lace Maker

The already known detailed provenance of The Lace Maker by Caspar Netscher (see Figure 1) provides us with sufficient information to assess the model.

Based on the given information of the auction catalogue, we can conclude that the artist is referred to as Gaspard Netscher (see Figure 7).

N.

NETSCHER (GASPARD), 1662.

Mr. Paillet

67. Peint sur toile, haut. 12 $\frac{1}{2}$, larg. 10 p.

7000 = Dans l'intérieur d'une Chambre basse, l'on voit une jeune Paysanne assise, et occupée à faire de la Dentelle; son visage, de profil, se détache dans un ton de couleur le plus fin et le plus vigoureux, sur un fond de Muraille grisâtre et argentin. Son Habillemeut rustique est composé d'une Jupe verte et d'un large Manteau de lin rouge, et sa tête est coiffée d'un béguin brodé en noir, indiquant l'ajustement des Filles orphelines. La position simple et naturelle de cette Figure, porte un caractère de vérité qui frappe de surprise et d'admiration. Il n'y a pour tous accessoires qu'un Ballet et deux Souliers. L'Artiste a ingénieusement interrompu l'uniformité de la Muraille, en y plaçant une Estampe de Paysage, négligemment attachée par deux clous, et sur laquelle il a placé son

TABLEAUX. 49

nôm. Ce Morceau au-dessus de tout éloge, offre encore un des rares et précieux articles de ce Cabinet.

Figure 7. Catalogue de la célèbre collection de tableaux de m. Van Leyden, d'Amsterdam, (Lugt nr.: 6864, available at RKD, The Hague), 1804, p.48-49.

When searching this name in the listed sources of the model, it becomes clear that this concerns a work by the painter Caspar Netscher (1635/36-1684) (see Figure 8). Netscher was born in Heidelberg, Germany, but moved to Arnhem in the Netherlands at quite a young age where he was an apprentice to Hendrick Coster (1615-1665), however there is no documentary evidence on this.¹³

After translating the elaborate description of the painting at step 2 of phase 1 of the model, it can be concluded that it is some kind of interior or genre painting. Central keywords that can be defined and that are distinctive in identifying the painting are: *interior, peasant girl, making lace, green skirt, large red bed coat, black embroidered crest, orphan girls* and *landscape print*. These keywords, defined at this first phase of the model, can be used in future steps, when the painting is hard to identify. Other information of importance are of course the annotations.

These provide us with the first step in the provenance trail, after the event of the auction of 1804. As can be seen in Figure 7, the buyer of the painter is mr. Paillet, who bought the painting for the sum of 7000 francs. As mentioned before, Joseph Paillet was not only auctioneer, but also part owner of the collection when it was auctioned. This means that Paillet bought this painting back for his own collection or either to make a profit on this painting by further sales, as he did with some other paintings in the Van Leyden auction as well. Furthermore, by studying the catalogue, the medium and dimensions of the painting can be identified and converted to present usage. This means that the artwork is painted in oil paint on canvas. By

¹³ [RKD Artist – Caspeter Netscher](#)

converting the old French sizes to centimeters, the dimensions have to be multiplied by approximately 2,7. In conclusion, the painting has to be about 33,75 x 27 cm.



Figure 8. C. Netscher, Self Portrait, 1660-1648, oil on panel, 28 x 22 cm, Rijksmuseum, inv.nr.: SK-A-2666.

After doing this, we will enter the next phase in the provenance research model, which concerns the verification and identification of the object with present knowledge in available sources. One quick search in the publication of the *Rapenburgproject*, results in the identification of the painting as the so called *Kantkloster (Lacemaker)* by Casper Netscher [23]. According to the authors it was, at least at the time of publication of the *Rapenburgproject*, at the Wallace Collection in London. To support this they refer to the catalogue of the museum [2] and to the Hofstede de Groot publication as well [9, pp. 171-172, no. 48]. Furthermore the authors of the publication state that the painting was sold for 7000 francs. A quarter of Van Leyden's art collection consisted of this type of genre paintings, amongst which the ones in the fine painting style were the most valued. The publication provides even more information when it comes to the provenance trail, since it mentions that the painting was bought by Delfos on behalf of Pieter Cornelis van Leyden at the Pompe van Meerdevoort auction in 1780.

Since the *Rapenburg project* was published in 1990, it is necessary to compare the existing facts that are listed in the book, to the website or recent catalogue of its current stated location. The painting is in fact still part of the Wallace Collection. Their online catalogue provides more details on the painting itself, as well as on the provenance trail.¹⁴ For example the date of the painting is according to the Wallace Collection 1662, confirming the date that was mentioned in the nineteenth-century auction catalogue. Besides that an extended provenance trail is provided, starting with Jacob Vallensis as a possible first owner. After that the painting enters the ownership of Johan Pompe van Meerdervoort and was sold on 19 May 1870 in his sale, at lot number 5, to Delfos, who probably bought it for Pieter Cornelis van Leyden. After that the work was inherited by his son, Diederik van Leyden and was sold in Paris between 5 and 7 November 1804 with the lot number 67. As became clear by the annotations, the first buyer from that moment was auctioneer Paillet. He bought it, according to the Wallace catalogue, for the art collector Francis Charles Seymour-Conway (1777-1842), the third Marquess of Hertford. He tried to sell the painting two more

times, but without any result: The first time at auctionhouse Christie's on 4 July 1807, at lot number 86, and the second time again at Christie's on 2 March 1808 at lot number 90. Hence the painting would stay in the private collection of the Marquess and that is why it is currently in the Wallace Collection, since the collection of his son, Richard Seymour-Conway the fourth Marquess of Hertford (1800-1870) formed the basis of the museum collection, that was established in 1897. The website of the Wallace Collection furthermore contains a description of the painting and information about certain marks and inscriptions. Considering the *Lacemaker*, it has no other inscriptions or marks than a signature by Netscher: C. Netscher 1662. In conclusion it also provides some literature about the painting. [27,28,29] By comparing this information, the extensive description of the painting in the Wallace catalogue and the image of the painting to the description in the Van Leyden auction catalogue, one has to conclude that that painting can indeed be identified as the *Lace Maker*. Because of the extensive amount of information provided by the website of the Wallace Collection it is not needed to consult other sources or to make use of Google Reverse Image Search or TinEye. This step is added to the model if a recent location of a painting is for example the website of an auction house. Since they often do not mention the buyer, the provenance trail remains incomplete. By searching the image on the web, with for example Google Reverse Image Search, one can find its current location if it is in a public collection or can even find in some cases more information about the provenance trail. So in completion of the research about the *Lacemaker*, it is nevertheless interesting to check what kind of extra information Google Reverse Image Search can add to the existing provenance trail. However the only result that seems in some way valuable that came out of the search, was a Wikipedia page about the painting.¹⁵ This page refers to the RKD website on which the painting carries the title *Woman making lace in an interior*.¹⁶ This webpage provides extra information considering literature about the painting, auctions at which the painting was offered for sale, what collections the painting was part of (distinguishing between possible and probable owners), visual documentation, related artworks and object information. This naturally leads to an increasing reliability of the provenance trail. All the data will be saved and potentially can be presented online in a Linked Open Data format.

5.2 An Italianate Evening Landscape

The second case study, *An Italianate Evening Landscape* (Figure 2) provides an example of the possible contribution of digital tools in provenance research, since this painting was not yet been identified in earlier publications or mentioned in current known analogue sources.

According to the auction catalogue, the painters of this object were Jean and André Both ([1], pp. 4-5). When checking different spelling options at the RKD website, following step 1 of the workflow model, one can conclude that the names of the painters possibly refer to Jan Both (1618-1652, figure 8a) and his older brother Andries Both (1611-1642, figure 8b).¹⁸ Jan and Andries were both born in Utrecht as sons of the decorative glass painter Dirk Both. Jan worked as a painter, etcher and draughtsman, where his brother just operated as a painter. They

¹⁴ Online catalogue of the [Wallace Collection](#), inv. p237, location: East Galleries II

¹⁵ [Wikipedia: The Lace Maker](#)

¹⁶ [RKD: Woman making lace in an interior](#)

¹⁸ RKD: [Jan Both](#) and RKD: [Andries Both](#)

both travelled to Rome (1635-1641) and Venice (1641-1642) and therefore made an essential contribution to the genre of Dutch Italianate landscape paintings.



Figure 8a. A. Willaerts, *Portrait of Jan Both*, 1628-1669, oil on panel, 13,6 x 10,5 cm, Sotheby's auction 02-02-2018, lot nr. 235.



Figure 8b. T. H. Jelgersma after A. Both, *Portrait of Andries Both*, 1741, pencil drawing on paper, 235 x 204 mm, Rijksmuseum inv. nr.: RP-T-1895-A-3077

With the artists of the painting established, it is necessary to define certain translated keywords of the description of the painting, following the second step of the first phase. After translating the description it becomes clear that the painting depicts a particular landscape. Nevertheless there are some distinctive elements that can be used as keywords, mentioned in the objects description, to identify the original painting. For example the translated original French description in step 2: "... a farmer on a donkey on the left who is talking to a shepherd near him...". The right side portrays two figures engaged in a conversation with each other. Further on, a farmer leading three cows on a turning road is depicted at the centre of the painting. Other keywords that can be defined are 'rocks', 'trees' and 'shrubs'. Another important step (3) in phase 1 that cannot be overlooked is the analysis of the annotations in the auction catalogue. The annotations state that Mr. la Roche was the buyer of the painting for the sum of 7600 francs. However, when searching the lot number in the Getty Provenance Index, a

conflicting result came to light. At the database the buyer is listed as Alexandre Joseph Paillet commissioned by a certain Mr. Herard. In addition, the Getty database also mentions Alexander Baring, first Baron Ashburton, as the previous owner of the painting.¹⁹ After converting the dimensions of the painting we can conclude that it must be approximately 137,7 by 170,1 centimeters. Besides the dimensions we were able to deduce that the object was painted on canvas.

All this information will be useful in the next phase, in which the object will be verified or identified with present knowledge in available sources. Nonetheless, no new information was brought forward by the prominent publications such as the *Rapenburgproject* or *Revolutionary Paris and the Market for Netherlandish Art*. Therefore, the steps (6-9) in phase 3, the actual provenance research, will have to be followed very extensively.

Since the Getty Provenance Index often mentions the current location of a painting, this will be the first lead in our search. However, the website had already been looked at for the interpretation of the annotations, but has not yielded any new information so far. Except for the fact that it had been sold again at an auction of 7th of July 2000. Since the database did not provide any further information, the next step had to be searching the RKD database for any images that match the description of the painting in the auction catalogue. When filtered by material, artist and genre, only 52 results were available. Nevertheless, all these landscapes are quite similar and do not match all the details of the description. Since the fact that both Andries and Jan Both were specialised in Italianate landscapes, their oeuvre consist mainly of many similar paintings in terms of theme and representation. This complicates the identification process. Further research in other analogue and digital sources was therefore inevitable. The fact that no extensive oeuvre catalogs were published about the Both brothers was problematic in this context. Only a few articles or exhibition catalogs were useful for research in analogue sources.²⁰ However, the same problem that occurred during the search in the RKD database is accountable for the identification of the object by studying the catalogs and articles as well. Many of the landscape paintings attributed to one of the Both brothers formed a possible match with the description in the catalogue. They nevertheless never fully complied. When searching the internet, more results came forward. By simply Googling 'Jan Both Diederik van Leyden' for instance, one encounters two useful websites in the identification of the painting. The first one is the website of the National Gallery of Art in Washington. The *Italianate Evening Landscape* by Jan Both matches the description of the object and mentions furthermore the Diederik van Leyden sale in the provenance.²¹ Besides that, a web page of a Christie's sale also came forward, that considered the same image as the one at the online catalogue of the National Gallery. There the painting was described as "an Italianate evening landscape with a muleteer and goatherds on a wooded path, a

¹⁹ [Getty Provenance Index](#). The previous owner was identified on the basis on the Hofstede de Groot publication [9], nr. 306.

²⁰ The exhibition catalog of the works of Jan Both was in this case especially beneficial for the identification of the painting. [25]

²¹ [National Gallery of Art: An Italianate Evening Landscape](#)

river and mountains beyond.²² The Christie's sale was held at July 7th in 2000, and is therefore the same auction as was listed in the Getty Database. It describes the same provenance trail as the National Gallery website and both sources seem to refer to the painting with lot number 6 in the 1804 auction catalogue. The attribution to both Jan and Andries Both seems to have changed over time, since the sources only refer to Jan Both. Finally, Google Reverse Image Search seems necessary to gain additional information that can confirm the attribution of the painting. When doing so, one encounters for example the Google Arts and Culture page, that links the painting of Both to other relevant paintings by the same artist or that are in the same collection or from the same period. Combining all the information of the different sources, one can conclude that the painting was made around 1650 and that it is 138,5 by 172,7 centimeters. The complete provenance trail, exhibition history and literature about the painting can be found at the website of the National Gallery of Art in Washington. Another interesting part of information forms the technical report, that was published by the National Gallery as well.²³

In the next section we will discuss not only the outcomes considering the digitizing and automating of certain steps in the mostly manual practice of provenance research, but we will also bring forward any challenges that came to light when establishing the identification of a painting according to the model.

6. DISCUSSION

Some interesting conclusions came to light when researching the provenance trail of *The Lace Maker* based on the steps provided in the constructed knowledge model. Both the outcome of our research and the challenges that we faced during this process will be discussed in this section.

The original purpose of the project was entering the complete provenance trail and all acquired object information in a data model and present this as Linked Open Data. The idea was based on combining heterogeneous information from different online sources and thereby automating most of the manual steps done by the art historical researcher. The use of heterogeneous sources, such as the RKD, Getty Provenance Index and The Wallace Collection, initially shows that a consistent digital data model is a necessity. The data model that was created for the pilot of the LAP project would have combined all the information of several websites, literary sources and complemented this information as well, because much information about the paintings in the Van Leyden collection is still unknown and a lot of the relevant sources, such as the annotated auction catalogues or *catalogue raisonné's*, are available but have not been digitized yet. Furthermore, the model mentions every source of information, with which the validity of the eventual database increases. Besides that, it facilitates art historical research as it connects several different sources to each other. In this stage of the LAP project, a lot of the research has to be done by hand. The manual aspect of the project is in some cases error prone, since false information in several publications can be taken over quite easily. On the other hand, information provided by online source is hard to validate, since the author or source is in many cases unknown. Nevertheless, the manual registration of the first provenance data forms a foundation for the automatic implementation of this information, the eventual purpose of the

project. Since in this way a standardized data model can be created, following set standards. During our research we eventually realized this was not quite as feasible as imagined at the start of the project. For example, the two main digital sources (RKD and Getty Provenance Index) provided us with inconsistent and undesirable results in our test cases and we quickly realized that we first needed to focus on how to acquire and process the data first, before directly forming a Linked Open Data model. Eventually these challenges changed the course of the project, in which we now created a knowledge acquisition model, representing (manual and digital) steps of provenance research that is shown in Figure 3. The eventual purpose of this model will be a potential presentation of the provenance of the paintings from the former Van Leyden collection in Linked Open Data. We also show the possibilities for enriching provenance research with automatisations. Besides that, the connection of information from heterogeneous sources in one homogeneous database provides future possibilities for art market and collection studies.

In this process we faced several challenges that are worth mentioning. Firstly, *The Lace Maker* appeared to be fitted with an extensive provenance trail, that was validated by several sources. The first problem that one encounters is the heterogeneity of information considering the provenance. For example, the use of terms such as 'possibly' and 'probably'. Both the RKD and the Wallace collection use these terms in different ways in the construction of their provenance trail. This shows an incidence in source material and, moreover, it is quite difficult to correctly interpret the terms without additional explanation. In addition, these definitions have to do with the uncertainty of the identification of the painting considering the description in the auction catalogue and have to be taken into account in context of the validity of that piece of the provenance trail.

Besides that we do know for a fact that Diederik van Leyden was no longer the owner when the collection of paintings of his father were sold at the Parisian auction. So between the event of the ownership of Diederik van Leyden and the event of the auction, another group of actors should be placed in the provenance trail. Alexandre Paillet, Louis-Bernard Coclers and Égide de Lespinasse de Langeac were the owners of the painting when it was sold, but are not mentioned in any of the known provenances. However, since a future Linked Open Data model has to interpret every information entered by the letter, we cannot overlook these steps in the provenance history when creating a database.

The knowledge acquisition model of provenance research gives insight in steps that can be automated or digitized. However some steps will remain manual, such as the interpretation of annotations. Since annotations can provide the first real clues of the provenance trail and complement a future data model, in a way that it will become even more useful for art historical research into art markets, they have to be used in the research. Moreover, it will show us some interesting details considering *The Lace Maker*.

²² [Christie's: An Italianate Evening Landscape](#). The painting was sold for 1.433.750 GBP.

²³ [National Gallery of Art: Technical Summary](#)

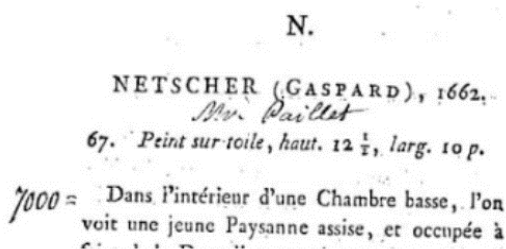


Figure 9. Fragment of the annotated catalogue RKD (Lugt 6864), p. 48.

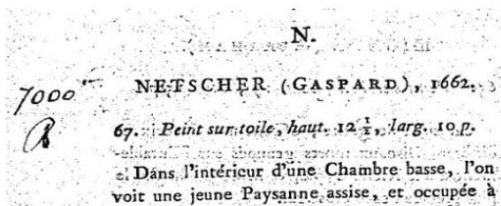


Figure 10. Fragment of the annotated catalogue Getty/Brill (Lugt 6841), p. 48.

When we look at the annotations in the RKD edition we clearly see as stated before that the painting by Netscher is bought by Mr. Paillet, referring to the auctioneer and part owner Alexandre Joseph Paillet, for a sum of 7000 francs²⁴ as is visible in Figure 8.

Some paintings are bought by Delaroche as well, the other auctioneer and owner of the auction house. This was for example shown by the annotations of the *Italianate Evening Landscape*. In fact, no connection can be made in matters of who bought what and when, considering both purchases of Delaroche and Paillet. Their names seem to appear in the annotations almost in a haphazard way. Besides that, in many cases, we do not even know if they bought for themselves or in commission. A good reason for the seemingly random divide of purchases by the auctioneers could be that they were both bidding on behalf of different clients, and, in Paillet's case, also for himself. Despite that, this was of course also an excellent method to increase prices during the auction. These uncertainties cause challenges for a digital database, where one must be very strict with entering information. The database works on the basis of exact times and places. That also means that the research is in fact not focused on the Van Leyden collection, since at the time of the auction, our starting point in the data model, it was owned by Paillet, Coclers and de Lespinasse de Langeac. All these factors play an important role in the construction of the data model and thus the final database and must be kept into mind when modelling the eventual database.

The annotated copy of the catalogue available at the Getty database seems to raise even more questions. As can be seen in Figure 9, The Lace Maker was sold for 7000 francs, nevertheless the buyer of the painting is described in a rather strange sign, that is hard to decipher. It can be interpreted as a letter "R" or "a" but it can also be a random scribble; in fact, we will probably never know. The only thing we can derive from the characters in comparison with the RKD copy is that they are only applied by the owner of the catalogue if the auctioneers

themselves bought the work of art. The same mark is used every time for both Delaroche and Paillet. Reading and interpreting nineteenth-century manuscripts cannot be done by computer processes yet. Not only because of the several handwritings that vary in legibility, but also because of the personal and in many cases difficult to read scrawls, that need to be interpreted by an expert. The fact that all the annotations have to be put into the data model manually makes this part of the project very error prone. In order to validate some of the interpretations of the names written in the annotations, we used the Getty Provenance Index Database²⁵. In this digitally accessible database, some of the lots mention a buyer as well as the source of this information. This greatly facilitated the interpretation process of the different spellings of names or unreadable handwriting; moreover, it demonstrates the importance of a consistent digital database supplemented with source references for validation. Although the question is whether the input of annotations can ever be automated, it does provide a relevant addition to the database.

Nevertheless, the current chosen examples are created to answer the questions we deemed suitable to answer questions of 'price and buyers', but might lack other information that might be useful in different fields of art history.

Adding annotations to the database can improve the contextualization not only of the value and appreciation of the Dutch seventeenth-century paintings at the time, but also of the actors partaking in the auction within the nineteenth-century art world. The attendees of the auction, mentioned in the annotations as buyers, and what they specifically bought is an indication of the reputation of the collection and the auction itself. The name "le Brun" appears for example many times as a buyer in the annotations. This probably refers to the French art dealer Jean Baptiste Pierre Le Brun (1748-1813), who collaborated among other things in the founding of the *Musée Central des Arts de la République in the Louvre Palace*. Such prominent figures indicate the importance of the Van Leyden sale in 1804 for the Parisian art world. Connections like this would be immediately traceable in a Linked data model and will give insight in the interested actors of the art market in that time. The same applies to the prices that, once entered into the database, will give a good overview of the appreciation of seventeenth-century Dutch artists. When following the steps of the knowledge acquisition model considering *the Lace Maker*, a lot of interesting results came forward. However, when searching other paintings of the Van Leyden auction, we sometimes faced other challenges.

In some cases we were not able to identify a painting, even when using all the steps in the model. There are several possible reasons for making it hard or even impossible to identify a painting. One of the causes is for example the fact that Dutch seventeenth-century artists often limited themselves to one specific genre, partly due to the open market for contemporary art. This means that when identifying a painting in the nineteenth-century auction catalogue based on selected keywords, many paintings come forward that match the description. This was the case with the painting of Both, nevertheless digital sources provided in this case a solution. Besides that other reasons for not finding a painting can be the fact that the painting was lost over time, for example because it was looted during World War II. When one suspects that is the case, there are several digital

²⁴ We know that it concerns francs as a monetary value since the first annotation state that all the amounts are in francs "en francs et cent" on the first page of the catalogue.

²⁵ [Getty Provenance Index Database Website](https://www.getty.edu/research/databases/provenance/index/)

sources or databases that can be used in confirming this theory.²⁶ Another possible explanation is that a painting no longer is attributed to the painter listed in the auction catalogue.

This means that the provenance trail ends in many cases after the first buyer at the nineteenth-century auction. The trail can also have a dead-end when the painting's most recent location is either a private collection or an auction. In the last case, Google Reverse Image search can provide an answer in the search of the most recent location of the painting, provided that it is in an openly accessible collection. Furthermore, the use of this type of research methods in an early stage is not always widely supported by art historians and specialists in provenance research. According to them it is best to start with, in their opinion more reliable, literary sources such as oeuvre or exhibition catalogues. However, as has been found, the use of such digital sources often produces results in a dead end.

Finally, some things are noticeable with regard to the description of the paintings. In some cases the description of a painting turned out to be a description in reverse of the associated image of the painting that was eventually found. This obviously makes the search for the right painting more difficult. However, this is not always the case and implies that there were two different experts engaged in writing the descriptions. There are namely two movements in describing the image of an art work. The first distinguish left and right when standing in front of the painting, however the second holds a reverse vision.

When the Linked Open Data model could have been finished and the formulated goal of mapping the Van Leyden collection would be accomplished, it offers many advantages to the current art-historical field of research. First of all, the model could serve as one source of a lot of accumulated information, coming from a large selection of primary, secondary analogue as well as digital sources. A clear and central database like this can be taken over directly by museum institutions but can also contribute to art collecting and art market studies. Since certain connections between different actors considering the Van Leyden collection, immediately become apparent within the database. In conclusion, the data model can be used in several different cases after this pilot and it is possible to permanently supplement the database, according to set guidelines. In this way, the provided information will always be up to date and consistent and can therefore contribute to art-historical research worldwide.

7. CONCLUSION

The current state of affairs of provenance research in the art history domain shows that there is a need for digital data models within the art-historical field of research. Data sciences can contribute to the progress of, in particular provenance-, research in the form of digital databases. Take for example the Getty Provenance Index Database. The LAP project responds as a pilot to this demand. In constructing a knowledge acquisition model, the LAP project provides the first steps in creating a potential Linked Open Data model. Since the knowledge acquisition model provides insight into the elements that can be digitized and provides a standardized tool for extracting heterogeneous information from different sources to convert them to one coherent entity for the eventual data model. By doing this the dispersed collection of Pieter Cornelis Baron van Leyden will be

mapped by a tool to enhance manual process by automated and digitizing steps that in the end prepare the data for the creation of a Linked Data model, eventually resulting in an online database. In this way an instrument is created that can enhance the manual process of provenance research. Moreover, it enables researchers to relate scattered and complex data to each other in a well-organized model. This will provide interesting perspectives for future provenance research and collecting or art market studies.

The fact that the model is very elaborate and refers to the origin of the various information increases the validation of the data and the identification of a painting. An eventual homogeneous data model, as a result of the knowledge acquisition model, facilitates art historical research; since the heterogeneous sources are united in one easy accessible database. The standardization that emerges in this case can make an important contribution to other databases, such as those of the RKD and the Getty Provenance Index Database, but can also contribute to digital catalogues of museum institutions. Except for the fact that this model can lay the foundation for a future database, it can endlessly be supplemented with new insights and pieces of information. In this way the data about the collection will be bundled in one place. Besides that, a future data model provides an excellent overview of the complete provenance history and connections between several actors in the art world, considering the Van Leyden collection, become instantly visible.

The knowledge acquisition model is also a useful tool for provenance researchers, since such practical overviews do not exist yet. Literature considering provenance research sometimes provides guidelines for this type of study, however this is often an academic and elaborate description. Besides that, it generally considers object-based provenance research, while in the case of the LAP project the starting point is a historical document. The designed knowledge acquisition model can therefore be used by provenance researchers or art historians engaged in studies about collecting history or the art market. By the formulation of the several practical steps that can be used on comparable cases as well, we provided them in a constructive and easy to follow method for their research.

The fact is that although a fully digitized and automated model for the acquisition of art historical information is desired, a lot of manual processes within this field of research will remain present. The input of annotations is for example mostly done by hand and the identification process of artworks asks for a lot of manual research in secondary literature and digital art-historical sources. The aim is of course that most of these manual processes can eventually be automated and digitized as much as possible and that the outcome of the research is eventually presented in a Linked Open Data format.

The case of the Van Leyden collection seems perfectly suitable for the implementation of such a data model, since the dispersed artworks provide an opportunity to trace and map them. With that in mind, the model not only can indicate advantages for provenance research on an object basis, but do this in a broader context as well. However there are some challenges that we encountered during the LAP project considering identifying the paintings, constructing a correct and validated knowledge acquisition model and the creation of the data model. Take for example the fact that there are three different Lugt numbers connected to this single auction. The exactness of the system and the data science sometimes seems difficult to reconcile with the art-historical research discipline, in which nuance often sets the tone. An eventual database proposed by the LAP project can

²⁶ Websites one can use are for example: [Lost Art](#), [The Munich Central Collecting Point](#), [the EER database](#) or the database of [Origins Unknown](#).

however support the art-historical research field and increase research results within provenance and collections- and market studies.

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APENDIX A

Results of various pipelines according to the workflow model

67. Gaspard Netscher	
Pipeline	1: 1804. Catalogue de la célèbre collection de tableaux de m. Van Leyden, d'Amsterdam. Lugt number: 6864 (RKD copy)
Phase 1	
Step 1	Netscher (Gaspard) à pipeline 2: RKD website: Caspar Netscher
Step 2	<p>Description painting:</p> <p><i>“Dans l’intérieur d’une Chambre basse, l’on voit une jeune Paysanne assise, et occupée à faire de la Dentelle; son visage, de profil, se détache dans un ton de couleur le plus fin et le plus vigoureux, sur un fond de Muraille grisâtre et argentin. Son Habilleme nt rustique est composé d’une Jupe verte et d’un large Manteau de lit rouge, et sa tête est coiffée d’un béguin brodé en noir, indiquant l’ajustement des Filles orphelines. La position simple et naturelle de cetre Figure, porte un caractère de vérité qui frappe de surprise et d’admiration. Il n’y a pour tous accessoires qu’un Ballet et deux Souliers L’Artiste a ingénieusement interrompu l’uniformité de la Muraille, en y plaçant une Estampe de Paysage, négligemment attachée par deux clous, et sur laquelle il a placé son nom. Ce Morceau au-dessus de tout éloge, offre encore un des rares et précieux articles de ce Cabinet.”</i></p> <p>Keywords:</p> <p>Interior, peasant girl, making lace, green skirt, large red bed coat, black embroidered crest, orphan girls and landscape print.</p>
Step 3	<p>Annotations:</p> <p>Mr. Paillet 7000=</p>
Step 4	<p>Specifications:</p> <p>Haut. 12 ½ , larg. 10 p. à 33,75 x 27 cm.</p> <p>Peint sur toile: paint on canvas</p>

<i>Phase 2</i>	
Pipeline	2: Th. H. Lunsing Scheurleer, C.W. Fock and A.J. van Dissel (1990) <i>Het Rapenburg. Geschiedenis van een Leidse Gracht</i>, Leiden, The Netherlands, p. 521
Step 5	<p>Artist: Caspar Netscher</p> <p>Title: De Kankloster</p> <p>Date: 1664</p> <p>Material: doek</p> <p>Dimensions: 24 x 28</p> <p>Collection: The Wallace Collection</p> <p>Price of painting at the auction: 7000 francs</p> <p>Provenance: Purchased by Delfos, commissioned by Pieter Cornelis van Leyden, at the Pompe van Meerdervoort auction in 1780.</p>
<i>Phase 3</i>	
Pipeline	<p>Online catalogue of the Wallace Collection: https://wallacelive.wallacecollection.org/eMP/eMuseumPlus (accessed at: 16-05-2019)à Used keyword: Netscher à https://wallacelive.wallacecollection.org:443/eMP/eMuseumPlus?service=ExternalInterface&module=collection&objectId=65171&viewType=detailView</p>

Step 8:

Artist:

Caspar Netscher (1639-1684)

Title:

The Lace Maker

Date:

1662

Material:

Oil on canvas

Dimensions:

33 x 27 cm

Collection:

The Wallace Collection, East Galleries II (inv. Nr.: P237)

Additional Information:

Description of the painting:

A pupil of Gerard ter Borch, Netscher specialised in small-scale genre scenes in the manner of his teacher. Later in his career, from c.1667, he focused instead on portraits of patrician subjects. Netscher's undisputed masterpiece, *The Lace Maker*, is one of the most successful representations of idealised female virtue in Dutch art. In the seventeenth century, women were frequently depicted as dangerous creatures, prone to vice if left to their own devices. Contemporary moralists recommended marriage and housewifery as the only fit occupations for women. Within the home, one of the housewife's principal duties was to maintain its order and cleanliness, implied in this picture by the broom propped against the wall on the left. The girl's modest woollen dress implies her lack of vanity, while her absorption in the delicate and difficult task of lace-making underlines her seriousness and moral rectitude. Such an image of the demure housewife, prudent and chaste, had wider implications too, since the home and its correct organization were considered of supreme importance in determining the moral fate of Dutch society as a whole.

Provenance:

[Possibly Jacob Vallensis]. Johan Pompe van Meerdevoort; his sale, Souterwoude, 19 May 1780, no. 5; Delfos, probably for P.C. van Leyden; Diederick van Leyden; his sale, Paris, 05-07 November 1804, no. 67; Paillet, for Francis Charles Seymour-Conway, 3rd Marquess of Hertford; his sales, Christie's, 04 July 1807, no. 86, bt. in, and Christie's, 02 March 1808, no. 90, bt. in.

Marks/inscriptions:

Signature: 'C. NETSCHER 1662.'

Further reading:

- Duffy, Stephen et al., *The Wallace Collection*, London: Scala Publishers Ltd. 2011
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Ingamells, J., 'The Wallace Collection Catalogue of Pictures IV', London: The Wallace Collection, 1985, pp. 245-247

*Further Pipelines used at step 8

67. Gaspard Netscher	
Pipeline	<p>Google Reverse Image Search: https://www.google.nl/search?tbs=sbi:AMhZZitmutN3Mjx3FkZAqanwhBCQyYDWg1DFuYJG5tXN0a_1mzrihMNLXKJGippKuoMH54LyQWYa4fba9sbfhJaQzPC3hnIQOr1DKrvzGe3ZwFysdOEVuFoi8Y6KnZGfcHUyRl2XITbLCav3XHrVe98gW2QBNEFJptgqiCPk4yCyrzBtRuBOm97LGweIDGfVELdajoGDLRRFfaP9zzijGizpOFWpYZzdzdQwd7-OzGDJXlnYepZphL9V_1tz5Bq1K0KZsVgPcBDV4yuNodLOhtZQ-OvIlkfBDKGFaaOtlxlpBbPfsAjjk0OdFNRtbuq_1rqVFXwwBhHCpilq5x4oKGgaXdf76lJyn7JQ&hl=nl (accessed at: 16-05-2019)à Wikipedia page: https://en.wikipedia.org/wiki/The_Lace_Maker</p>
Artist	Caspar Netscher
Title	The Lace Maker
Date	1662
Material	Oil paint
Dimensions	33 cm (13 in) x 27 cm (11 in)
Collection	The Wallace Collection (inv. Nr.: P237)

Additional information	<p>Description of the painting:</p> <p>The Lace Maker (1662) is an oil on canvas painting by the Dutch painter Caspar Netscher. It is an example of Dutch Golden Age painting and is part of the Wallace Collection.</p> <p>The woman is sitting working over a lace pillow on bobbin lace.</p> <p>Documentation:</p> <p>This painting was documented by Hofstede de Groot in 1913, who wrote; "48. THE LACE MAKER. Sm. 21. Full length. A young girl, simply dressed, sits in profile to the right. She is working with both hands at a bobbin-lace cushion held on her lap. She wears a green skirt, a bright red bodice with the white under-garment showing at the neck and the elbows, and a light cap embroidered in black. Behind her on the floor in the left foreground lie her shoes ; beyond them, in the corner, stands a broom. At the back is a sunlit wall, on which to the right an unframed landscape print is loosely pinned with two nails. Signed "C. Netscher," on the margin of the print, and dated 166- [1662, according to the Pompe sale-catalogue] [but 1664, according to Sir Claude Phillips and Mr. D. S. MacColl Translator] ; panel [canvas, according to Mr. MacColl], 13 inches by 10 1/2 inches. Exhibited at the British Institution, London, 1818.</p> <p>Sales:</p> <p>J. Pompe van Meerdervoort, Soeterwoude, May 19, 1780, No. 5 (700 florins, Delfos). M. van Leyden, Paris, September 10, 1804 (7000 francs, Paillet) see Ch. Blanc, ii. 221. London, 1807 (£199 : 10s.). In the collection of the Marquess of Hertford, London, 1833 (Sm.). In the Wallace Collection, London, 1910 catalogue, No. 237."[1]</p> <p>Links:</p> <ul style="list-style-type: none"> - 48. The Lace Maker in Hofstede de Groot, 1913: https://commons.wikimedia.org/w/index.php?title=File%3AHofstede de Groot catalogue raisonn%C3%A9%2C Volume 5%2C 1913.djvu&page=180 - Woman making lace in an interior, 1662 in the RKD: https://rkd.nl/nl/explore/images/237494
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67. Gaspard Netscher

Pipeline	Wikipedia page: https://en.wikipedia.org/wiki/The_Lace_Maker (accessed at 16-05-2019) à Link to Hofstede de Groot fiche 48, 1913 (Wikipedia file: Hofstede de Groot catalogue raisonné, vol. 5, 1913.djvu): https://commons.wikimedia.org/w/index.php?title=File%3AHofstede de Groot catalogue raisonn%C3%A9%2C Volume 5%2C 1913.djvu&page=180
Artist	Caspar Netscher
Title	The Lace Maker
Date	166- [1662, according to the Pompe sale-catalogue] [but 1664, according to Sir Claude Phillips and Mr. D. S. MacColl Translator]
Material	Paint
Dimensions	13 inches by 10 ½ inches
Collection	The Wallace Collection, London, 1910 catalogue, No. 237

Additional information	<p>Description of the painting:</p> <p>THE LACE MAKER. Sm. 21. Full length. A young girl, simply dressed, sits in profile to the right. She is working with both hands at a bobbin-lace cushion held on her lap. She wears a green skirt, a bright red bodice with the white under-garment showing at the neck and the elbows, and a light cap embroidered in black. Behind her on the floor in the left foreground lie her shoes ; beyond them, in the corner, stands a broom. At the back is a sunlit wall, on which to the right an unframed landscape print is loosely pinned with two nails.</p> <p>Signature:</p> <p>Signed "C. Netscher," on the margin of the print</p> <p>Exhibitions:</p> <p>The British Institution, London, 1818.</p> <p>Sales:</p> <p>J. Pompe van Meerdervoort, Soeterwoude, May 19, 1780, No. 5 (700 florins, Delfos). M. van Leyden, Paris, September 10, 1804 (7000 francs, Paillet) see Ch. Blanc, ii. 221. London, 1807 (£199 : 10s.). In the collection of the Marquess of Hertford, London, 1833 (Sm.). In the Wallace Collection, London, 1910 catalogue, No. 237.</p>
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Pipeline	6: Wikipedia page: https://en.wikipedia.org/wiki/The_Lace_Maker (accessed at 16-05-2019) à Link to the RKD webpage of the painting: https://rkd.nl/nl/explore/images/237494
Artist	Caspar Netscher
Title	The Lace Maker, English title: Woman making lace in an interior
Date	1662
Material	Oil on canvas
Dimensions	33 x 27 cm
Collection	Wallace Collection, London , inv./cat.nr P237

Additional
information

Signature/inscription:

signed and dated center right: C. NETSCHER 1662

on the print

Keywords:

genre, one human figure, full-length portrait, interior view, young woman, making bobbin lace, mutche, broom, chair, print (depicted), mussel (common mussel), shoe with square toe, wooden floor

Artistically related to other work:

- Inspired by: Johannes Vermeer, De melkmeid
Netscher adopted the modest setting, the motif of a woman showing her as a silhouette starkly contrasted against the white plastered wall, the irregularities in the surface structure of this wall, the fine balance between the forms and the empty space, the fall of diffuse light coming from the left, the soft focus with which the artist observed his subject, the concentrated attitude of the woman and the stillness of the scene (Wieseman 2002, p. 57).

- Inspired by: Quiringh van Brekelenkam, Kantklossende vrouw in een interieur
Netscher adopted the subject, the use of a single full-length figure and the figure type in general (as observed by E. Schavemaker).

- Related to: Gabriel Metsu, Kantklossende vrouw
Netscher adopted the use of a single, full-length figure, the subject and the motif of a painting or a print on the wall.

- Used as model for: Johannes Vermeer, De kantwerkster
Vermeer adopted the subject of a young woman preoccupied with making lace, and the tactile sense of Netscher's painting, especially the structure of the white-plastered back wall (Waiboer et al. 2017, p. 197).

- Copied in drawing by: Abraham Delfos, Kantklossende vrouw in interieur

Provenance collections:

private collection Jacob Vallensis, Delft

possibly

private collection Catherina van der Dussen, Delft

probably

private collection Johan Pompe van Meerdervoort, Leiden/Voorschoten

probably

-1779

private collection Pieter Cornelis baron van Leyden

probably

1780 -

private collection Diederik baron van Leyden (III), Leiden/Amsterdam

probably

private collection 3rd Marquess of Hertford, Hertford House (London)

6. Jan and Andries Both

Pipeline	1: 1804. Catalogue de la célèbre collection de tableaux de m. Van Leyden, d'Amsterdam. Lugt number: 6864 (RKD copy)
<i>Phase 1</i>	
Step 1	Jean et André Both à RKD: Jan and Andries Both
Step 2	<p>Description painting:</p> <p><i>'Point de Vue d'un vaste Pays de la plus étonnante richesse. Sur le devant , dans une demi-teinte savante , est un Terrain élevé et entrecoupé de Rochers , Arbustes et grands Arbres, qui servent du plus riche repoussoir à un Chemin enrichi de belles Figures, parmi lesquelles on remarque, à gauche, un Paysan sur un Ane, arrêté pour causer avec un Pâtre qui est près de lui , et deux autres du côté opposé, qui s'entretiennent pareillement ensemble; plus loin , au milieu, dans un Chemin tournant, l'on distingue un Paysan conduisant trois Vaches. La gauche est terminée par une masse de Roches de la forme la plus heureuse, et couverte presque en totalité de Broussailles , d'Épines et de différentes Plantes. La droite offre un lointain de Montagnes baignées par une grande étendue d'eau. Nous ne pouvons nous dispenser d'arrêter encore les yeux des Connaisseurs, sur la brillante exécution des Arbres qui enrichissent cette Production, et dont le feuillé admirable se détache avec légèreté sur le ciel le plus heureux , indiquant une belle soirée d'été. Ce Tableau capital et de la plus rare perfection , offre sans contredit le chef-d'oeuvre de son Auteur, et même de son genre.'</i></p> <p>Keywords:</p> <p>Landscape, trees, shrubs, donkey, farmer, shepherd, cows.</p>
Step 3	<p>Annotations:</p> <p>Mr. la Rocheà Getty: Alexandre Joseph Paillet for Herard 7600 francs.</p>
Step 4	<p>Specifications:</p> <p>Larg. 63, haut 51 p.</p> <p>Peint sur toile: paint on canvas</p>
<i>Phase 2</i>	

Pipeline	2: Th. H. Lunsing Scheurleer, C.W. Fock and A.J. van Dissel (1990) <i>Het Rapenburg. Geschiedenis van een Leidse Gracht</i> , Leiden, The Netherlands, p. 521
Step 5	No results
Phase 3	
Pipeline	Getty Provenance Index: http://piprod.getty.edu/starweb/pi/servlet.starweb
Step 6	Most recent location: unknown
Pipeline	RKDImages: Keywords: Jan Both, painting, canvas, landscape: https://rkd.nl/nl/explore/images#query=jan%20both&filters%5Bkunstenaar%5D%5B%5D=Both%2C%20Jan&filters%5Bobjectcategorie%5D%5B%5D=schilderij&filters%5Bdrager%5D%5B%5D=doek&filters%5BRKD_algemene_trefwoorden%5D%5B%5D=berglandschap&start=0 (accessed at 16-05-2019).
Step 7	No results
Step 9	Consult other sources
Pipeline	P.J.J. van Thiel, H. Wine and R. Kopland (1991) <i>Meeting of masterpieces: Jan Both – Claude Lorrain</i> , London, Great-Britain.
Step 9.1	No results
Pipeline	Website Christie's via: Google search→ Jan Both Diederik van Leyden: https://www.christies.com/lotfinder/Lot/jan-both-utrecht-c-1618-1652-an-1849280-details.aspx

Artist

Jan Both (Utrecht 1618-1652)

Title:

An Italianate evening landscape with a muleteer and goatherds on a wooded path, a river and mountains beyond

Material:

Oil on canvas

Dimensions:

54½ x 68 in. (138.5 x 172.7 cm.)

Additional information:

Signed: JBoth' (JB linked, lower left)

Provenance: Pieter Cornelis, Baron van Leyden and Heer van Vlaardingen (1717-1788), by whom bequeathed to his son

Diderick van Leyden, Heer van Vlaardingen (d. 1811), Huis met de Hoofden, Amsterdam, by whom sold, with the rest of his father's painting collection, for 100,000 florins to a consortium formed by L.B. Coclers, Alexander Joseph Paillet and A. de Lespinasse de Langeac; sale, Paillet and Delaroché, Paris, 7 November 1804 (delayed from 5ff. June 1804), lot 6 'Point de Vue d'un vaste Pays de la plus étonnante richesse...Nous ne pouvons nous dispenser d'attêter encore les yeux des Connaisseurs, sur la brillante exécution des Arbres qui enrichissent cette Production, et dont le feuillé admirable se détache avec légèreté sur le ciel le plus heureux, indiquant une belle soirée d'été. Ce Tableau capital et de la plus rare perfection, offre sans contredit le chef-d'oeuvre de son Auteur, et même de son genre' (7,600 francs to Paillet on behalf of Herard).

Alexander Baring, later 1st Baron Ashburton (1774-1848), Bath House, Piccadilly, London, by 1821 when exhibited at the British Institution, and by descent to his son

William, 2nd Baron Ashburton (1799-1864), Bath House, by whom bequeathed to his widow Louisa Caroline, Lady Ashburton, née Mackenzie (d. 1903), Bath House, London, and sold by her executor and son-in-law, William, 5th Marquess of Northampton, K.G. (1851-1913), to a consortium of Agnew's, Charles Davis, Arthur J. Sully and Asher Wertheimer, and presumably retained by Wertheimer until

Asher Wertheimer; (+) Christie's, London, 18 June 1920, lot 6 (105 gns. to Seligman?).

Charles Hubert Archibald Butler, Shortgrove, Newport, Essex; Christie's, London, 26 June 1964, lot 51, erroneously described as having come from the collection of his grandfather, Charles Butler, Warren Wood [presumably having been confused with a landscape by Both lent by the latter to the British Institution in 1864] (4,800 gns. to Brod).

with Alfred Brod, London, 1964-5.

with Hazlitt, Gooden and Fox, 1966-7, by whom sold to the present owners.

Literature: J. Smith, *A Catalogue Raisonné*, etc., VI, 1835, p. 179, no. 23, and p. 199, no. 78, 'This superlative production is painted throughout in the artist's most finished manner, and in the richest hues of a refulgent sun-set [sic]. G.F. Waagen, *Treasures of Art*, etc., II, London, 1854, p. 111, 'The warm, but not, as sometimes with him, exaggerated, evening light, the more solid impasto, and the more careful execution, make this one of the most beautiful pictures of the master...'. C. Hofstede de Groot, *Verzeichnis der Werke*, etc., IX, Esslingen and Paris, 1926, p. 505, no. 306.

A. Blankert, ed., catalogue of the exhibition, *Nederlandse 17e Eeuwse Italianiserende Landschapschilders*, Utrecht, Centraal Museum, 1965, reprinted, Soest, 1978, p. 126, no. 7.

J.D. Burke, *Jan Both: Paintings, Drawings and Prints*, D. Phil. diss., Harvard, 1972, illustrated, reprinted New York and London, 1976, pp. 200-201, no. 31, as probably from the late 1640s.

Exhibited:

London, British Institution, 1821, no. 55.

London, Brod Gallery, 25th Exhibition of Old Master Paintings, 1964, no. 41.

Utrecht, Centraal Museum, *Nederlandse 17e eeuwse Italianiserende landschapschilders*, 1965, no. 51.

Pipeline

Via Google Image Search: website National Gallery of Art Washington → zoekterm: Jan Both:
<https://www.nga.gov/collection/art-object-page.117150.html#provenance>

Artist

Jan Both (Dutch, 1615/18-1652)

Title:

An Italianate Evening Landscape

Date:

c. 1650

Material:

Oil on canvas

Dimensions:

138,5 x 172,7 cm (54 ½ x 68 in.)

Collection:

Washington: National Gallery of Art, inv.

nr. 200.91.1, On view: West Building, Ground Floor - Gallery 37

Additional information:

Provenance: Pieter Cornelis, baron van Leyden [1717-1788, known during his lifetime as the Heer van Leyden van Vlaardingen], Leiden;[1] by inheritance with the paintings in his collection to his son, Diederik van Leyden [1844-1810/1811], Leiden and Amsterdam;[2] sold, with the rest of his father's painting collection, to a consortium formed by L.B. Coclens, Alexander Joseph Paillet, and A. de Lespinasse de Langeac;[3] (sale, Paillet and Delaroche, Paris, 5-8 November 1804, no. 6);[4] purchased by Paillet for Herard. Alexander Baring [later 1st baron Ashburton, 1774-1848], Bath House, London, by 1821;[5] by inheritance to his son, William Bingham Baring, 2nd baron Ashburton [1799-1864], Bath House, London; by bequest 1864 to his wife, Louisa Caroline, Lady Ashburton [née Mackenzie, 1827-1903], Bath House, London; sold by her executor and son-in-law, William George Spencer Scott Compton, 5th marquess of Northampton [1851-1913], to a consortium of (Thos. Agnew & Sons, Charles Davis, Arthur J. Sully, and Asher Wertheimer, all in London); presumably retained by Wertheimer until (his sale, Christie, Manson & Woods, London, 18 June 1920, no. 6, as A Woody Landscape); (Permain, London).[6] Charles Hubert Archibald Butler [1901-1978], Shortgrove, Newport, Essex; (sale, Christie, Manson & Woods, London, 26 June 1964, no. 51);[7] (Alfred Brod Gallery, London), until at least December 1965.[8] (Hazlitt, Gooden and Fox, London), 1966-1967; sold to private collection; (sale, Christie, Manson & Woods, 7 July 2000, no. 17); purchased by NGA.

[1] The provenance is taken from the 7 July 2000 sale catalogue. About the Van Leyden collection, see the description of Sale F-80, by Benjamin Peronnet, in *The Getty Provenance Index© Databases*, accessed 17 February 2012, and J.W. Niemeijer, "Baron van Leyden, Founder of the Amsterdam Print Collection," trans. Patricia Wardle, *Apollo* (June 1983): 461-468. As Niemeijer explains, in Van Leyden's own day the title of baron was not actually used; when alive he was known as the Heer Van Leyden van Vlaardingen. He is given the title of baron in later publications, a title that was indeed his, as an ancestor was created a baron of the Holy Roman Empire in 1548.

[2] Niemeijer 1983, 468. While his son inherited the paintings, Van Leyden's large and important print collection was bequeathed to his grandson, after whose death in 1789 it became the property of the young man's mother. Sold in 1806 to Louis Napoleon, it was housed first in The Hague, then Paris, and was eventually returned in 1816 to Amsterdam, where it formed the nucleus of the print collection at the Rijksmuseum.

[3] The sale catalogue does not cite a source for this information.

[4] The sale was originally scheduled for 5 July 1804, and rescheduled for 10 September 1804 (the date printed on the sale catalogue), before finally taking place in November.

[5] Baring lent the painting to an 1821 exhibition at the British Institution.

[6] The 2000 sale catalogue indicates that the painting was “possibly purchased by Seligman” at the 1920 sale. However, the annotated copy of the 1920 sale catalogue available on microfiche in the Christie’s catalogues from the Knoedler Library gives the buyer as “Permain,” who might be the London dealer William Permain.

[7] The painting was erroneously described in the sale catalogue as having come from the collection of his grandfather, Charles Butler of Warren Wood, presumably having been confused with a landscape by Both lent by his grandfather to the British Institution in 1864 (no. 88).

[8] The painting was offered by the Alfred Brod Gallery to the National Gallery of Art in December 1965 (original letter of 13 December 1965 in NGA Photographic Archives, copy in NGA curatorial files).

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1821

British Institution for Promoting the Fine Arts in the United Kingdom. A catalogue of pictures of the Italian, Spanish, Flemish, and Dutch schools: with which the proprietors have favoured the Institution. Exh. cat. British Institution, London, 1821: 16, no. 55.

1829

Smith, John. A Catalogue Raisonné of the Works of the Most Eminent Dutch, Flemish and French Painters. 9 vols. London, 1829-1842: 6(1835):179, no. 23,199-200, no. 78.

1854

Waagen, Gustav Friedrich. Treasures of Art in Great Britain: Being an Account of the Chief Collections of Paintings, Drawings, Sculptures, Illuminated Mss.. 3 vols. Translated by Elizabeth Rigby Eastlake. London, 1854: 2:111.

1907

Hofstede de Groot, Cornelis. Beschreibendes und kritisches Verzeichnis der Werke der hervorragendsten holländischen Maler des XVII. Jahrhunderts. 10 vols. Esslingen and Paris, 1907-1928: 9(1926):505, no. 306.

1964

Alfred Brod Gallery. 25th Exhibition of Old Master Paintings. London, 1964: no. 41.

1965

Houtzager, Maria Elisabeth, H.J. de Smedt, and Albert Blankert. Nederlandse 17e eeuwse Italianiserende landschapschilders. Exh. cat. Centraal Museum, Utrecht, 1965: 126, no. 57.

1972

Burke, James Donald. "Jan Both: Paintings, drawings, and prints." Ph.D. dissertation, Harvard University, Cambridge, 1972: 200-201, no. 31.

1978

Blankert, Albert. Nederlandse zeventiende eeuwse Italianiserende landschapschilders. Revised and enlarged ed. Exh. cat. Centraal Museum, Utrecht. Soest, 1978: 126, no. 57.

2003

Waagen, Gustav Friedrich. Treasures of Art in Great Britain. Translated by Elizabeth Rigby Eastlake. Facsimile edition of London 1854. London, 2003: 2:111.

For further information about: exhibition history, technical rapport, entry, related terms and inscription, see the link.

APPENDIX B

Paintings that are so far identified by using the workflow model (the paintings that are mentioned in the *Rapenburgproject* are excluded, except when we found new information).



Nicolaes Pietersz. Berchem, *View of an Italian Port*, early 1660s, oil on canvas, 48 x 59,5 cm, Washington: National Gallery of Art, inv.: 1990.62.1



Cornelis Bega, *Rustic Interior*, 1662, oil on canvas, 44 x 39 cm, Paris: Musée du Louvre, inv.: 1032



Gerrit Adriaenszoon Berckheyde, *Amstel 216*, 1685, oil on canvas, Amsterdam: Six Collection



Abraham Beerstraten, *Winter View of Leyden*, 1660s, oil on canvas, 88 x 128,2 cm, St. Petersburg: State Hermitage Museum, inv.: ГЭ-6850



Govaert Dircksz. Camphuysen, *An Amorous Couple in a Barn with Herdsmen at the Door*, c. 1623-1672, oil on panel, 61,3 x 54,3 cm, New York: Sotheby's Masterpieces sale (22nd of May 2018), lot nr. 71



Jan van der Heyden, *The Château of Goudestein, on the River Vecht, near Maarsen*, 1674, oil on canvas, 55,6 x 71,8 cm, London: The Wellington Collection, inv.: WM.1501-1948



Willem van Mieris, *Lot and his Daughters*, 1709, oil on panel, 38,1 x 32 cm, New York: Sotheby's Important Old Master Paintings Including European Works of Art sale (24th of January 2008), Lot nr.: 319



Domenicus van Tol, *Children with a mousetrap*, 1660-1676, oil on panel, 31 x 25 cm, Amsterdam: Rijksmuseum Amsterdam, inv.: SK-A-417



Jacob van der Ulft, *Dido showing Aeneas the construction of the city of Carthage*, 1627-1689, oil on canvas, 80,6 x 134,6 cm, whereabouts unknown.

Source: http://www.artnet.com/artists/jacob-van-der-ulft/dido-showing-aeneas-the-construction-of-the-city-fMoqLiEec81_MmrycNPfeQ2