

DH DAY // 27.01.2026

TRANSCRIPTION TECHNIQUES

Approaches, tools,
and challenges

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Alessandra Failla



PISA.

Camposanto.

28149	Andrea da Firenze (Bonaiuti). La conversione di S. Ranieri . . .	N
28150	— La partenza di S. Ranieri per la Palestina.	N
28151	— Miracoli e tentazioni di S. Ranieri.	N
28152	Antonio Veneziano. Ritorno a Pisa e miracoli di S. Ranieri . . .	N
28153	— — Particolare: S. Ranieri smaschera l'oste . . .	N
28154	— — — S. Ranieri invitato a desinare dai canonici del Duomo.	N
* 28155	— — — Tre teste di personaggi	N
* 28156	— — — Un Santo nel fregio dell'affresco.	N
28157	— La morte di S. Ranieri (frammento)	N
* 28158	— — Particolare: Testa di donna	N
28159	Bonamico Buffalmacco (ora attribuito a Francesco da Volterra e aiuti). L'Ascensione (parte superiore)	N
28160	— La Crocifissione.	N
28161	— La Resurrezione	N
28162	— L'incredulità di S. Tommaso	N
28163	Francesco da Volterra (ora attribuito a Giovanni di Taddeo Gaddi). Le sventure di Giobbe.	N
28164	— — Particolare: Parte inferiore sinistra	N
28165	— — — Parte inferiore destra.	N
28166	— — — Due teste.	N
28167	— — — Due teste.	N
28168	— — — Tre teste.	N
28169	— Convito di Giobbe.	N
28170	— Dio permette a Luc.	N
28171	— — Particolare: I Sabe.	N
28172	— — — I Sabe.	N
28173	Giotto (Scuola). Frammento con due teste.	N
28174	— — — con mezza figura.	N
28175	Gozzoli Benozzo. La vendetta di Iacopo.	N
28176	— — Particolare:	N
28177	— — — Le nuvole.	N

Sources: Anderson, Domenico: "Fotografie di D. Anderson. Catalogo X. Pisa - Lucca - Arezzo. E Dintorni: S. Sepolcro - Città di Castello, ecc.", 1928, p. 5 (above); Photothek of the KHI, Inventarbuch I (right).

Datum	Inv.-Nr.	Künstler	Gegenstand	Ort	Signatur
1900	Penugino	haupt zw. Ende u. Haubt. S.	Paris, Louvre	Ma XV	
1901	Loffredo Costa	Mythol. Szenen	"	"	
1902	Manzagna	Parnass	"	"	
1903	Giov. Bellini	Mda m. 2 Hll.	Petersburg Eremit.	"	
1904		Adam	Rom, Gall. Borghese	"	
1905		Eva	"	"	
1906	Giorgione	Die Fledhnesser	Wien, Belvedere	Ma XVI	
1907		Tudorh	Petersburg Eremit.	"	
1908		Mda m. 2 Hll.	Madrid, Prado	"	
1909	Rondinelli	Madonna	Rom, Gall. Doria	"	
1910		Mda m. Joh.	"	"	
1911	Palma Vecchio	Mda, 2 Hll., Sifler	Chantilly	"	
1912		Mda m. Hll.	Petersburg Eremit.	"	
1913		Anbetg. der Hl. drei	"	"	
1914	Tarbo Bassano	Anbetg. der Hl. drei	Madrid, Prado	"	
1915	Francesco di St. Croce	Urbach, vor Christus	Petersburg Eremit.	"	
1916	Filippo Mazzola	Pizzi, c. Maynes	Rom, Gall. Doria	"	
1917		Portrait c. Hammes	"	"	
1918	Andrea del Sarto	Disputation	Florenz, Pitti	"	
1919	Botticelli	Trauernde Madon.	Rom, Gall.	"	
1920	Benzadino Licinio	Portrait c. Fran	Dresden, Gall.	Ma XVII	

Source materials and challenges

Handwritten Documents

Inconsistent handwriting styles, archaic scripts, and ink bleeding through paper.

Printed Documents

Faded or blurry ink, non-standard historical fonts, complex layout, and physical damage to pages.

Annotated Material

Distinguishing between original printed text and handwritten notes that may overlap or run into the margins.

Fundamentals: Layout analysis and Segmentation

Layout Analysis (Region Detection)

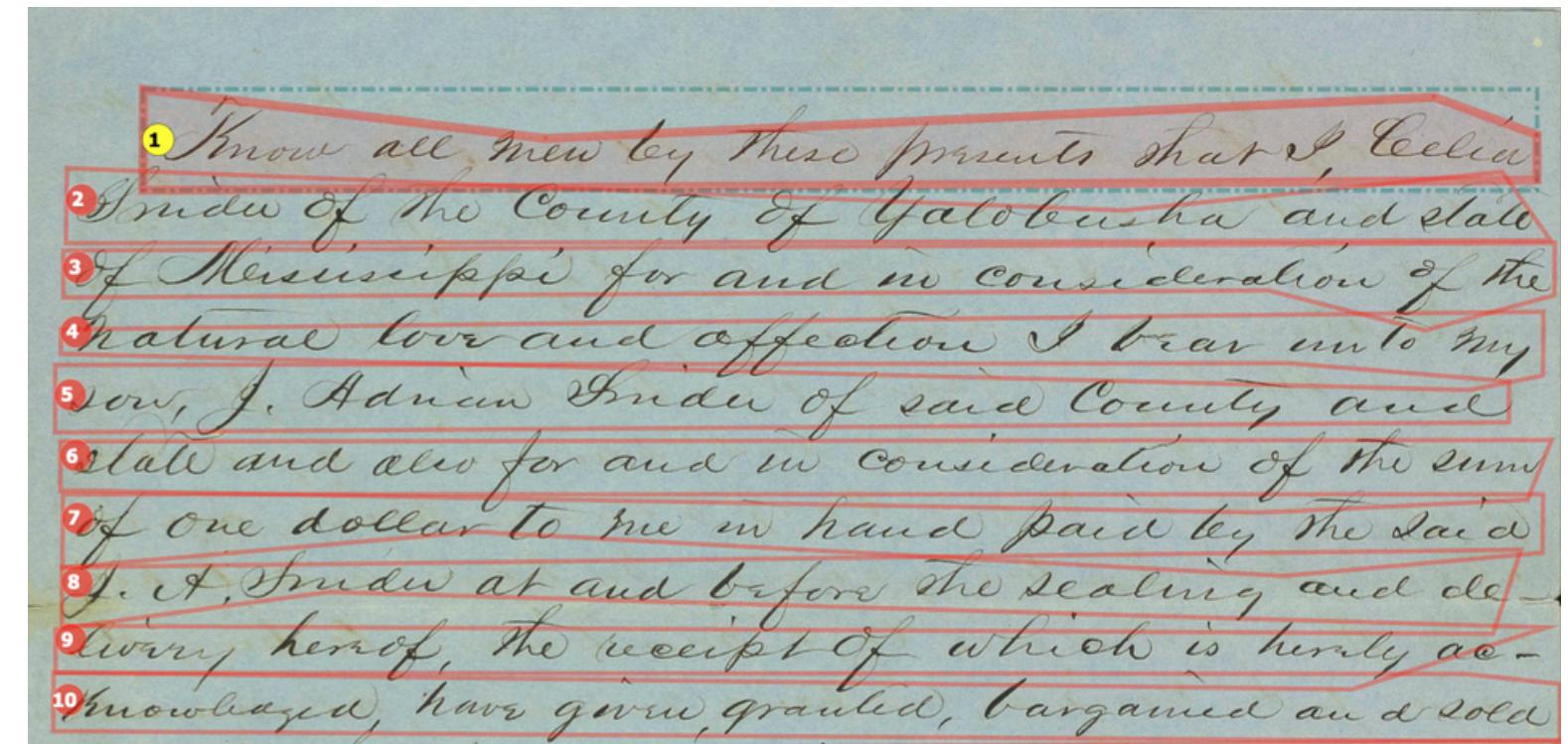
The AI identifies different "zones" on a page, such as text blocks, images, headings, and margins.

Segmentation

The process of cutting the text blocks into individual lines and words so the computer can read them one by one.

Challenges

Complex layouts, like multi-column pages or scattered notes in a diary, often confuse the AI, leading to text being read in the wrong order.



Source: <https://scholarblogs.emory.edu/ecds/transcribe-with-transkribus/>

Traditional Recognition Frameworks

Optical Character Recognition (OCR) for printed text



How it works

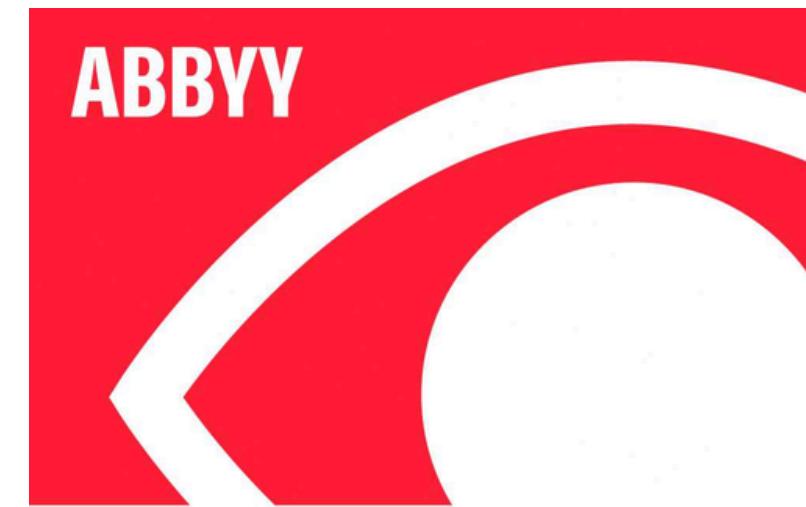
The software looks for patterns that match standard, modern fonts.

Standard Tools

- **ABBYY FineReader** A commercial tool used to keep the original page look and create searchable PDFs.
- **Tesseract** A free, open-source tool often used for large-scale library projects.

Limitations

These tools often struggle with historical decorative fonts, complex layout, or paper that is stained or wrinkled.



FineReader PDF



Tesseract OCR

Handwritten Text Recognition (HTR) and Transkribus

Beyond Pattern Matching

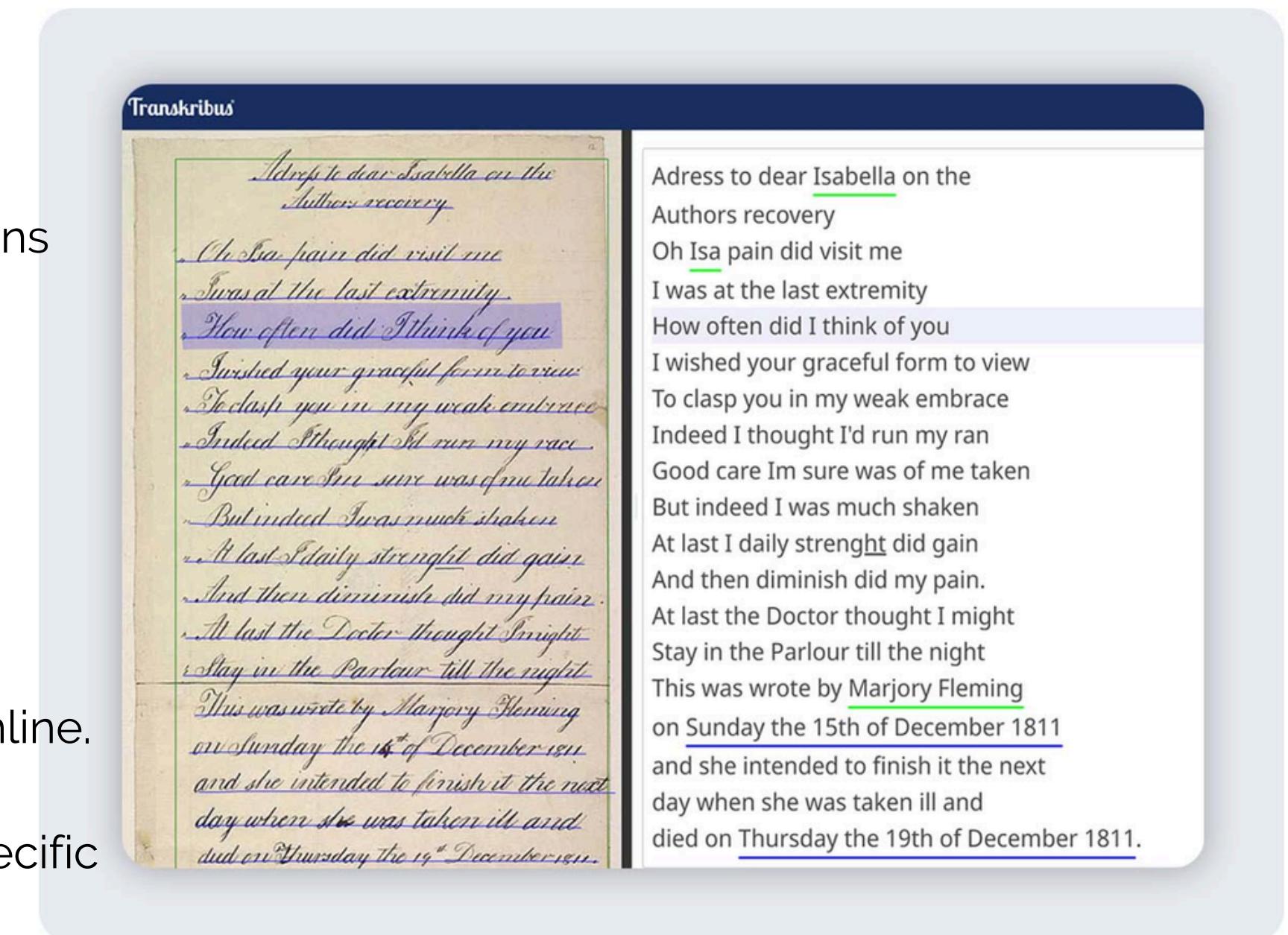
Modern HTR uses "context" to guess words, much like how humans read a sentence to understand a messy word.

Transkribus

A specialized platform for historical documents. It allows users to manage archives and train custom AI models.

Collaborative Transcription

This allows a team of researchers to work on the same project online. One person can transcribe, another can check the work, and everyone's corrections help "teach" the AI to get better at that specific handwriting.



The image shows a screenshot of the Transkribus platform. On the left, a handwritten letter in cursive is displayed, with some words underlined in green. On the right, the transcribed text is shown in a clean, printed format. The transcribed text reads:

Address to dear Isabella on the
Authors recovery
Oh Isa pain did visit me
I was at the last extremity
How often did I think of you
I wished your graceful form to view
To clasp you in my weak embrace
Indeed I thought I'd run my race
Good care You sure was of me taken
But indeed I was much shaken
At last I daily strength did gain
And then diminish did my pain.
At last the Doctor thought I might
Stay in the Parlour till the night
This was wrote by Marjory Fleming
on Sunday the 15th of December 1811
and she intended to finish it the next
day when she was taken ill and
died on Thursday the 19th December 1811.

Ground Truth and Model Performance

GROUND TRUTH

Defining Ground Truth

A small set of pages (50–100) transcribed perfectly by a human to show the AI what the "correct" result looks like.

TRAINING

The Training Process

The AI compares its guesses to the Ground Truth and learns from its mistakes.

CONTEXT

The Context Challenge

AI models are specialized rather than universal; a tool trained on one specific type of document may not work well when the language, time period, or writing style changes.

Generative AI and Large Language Models (LLMs)

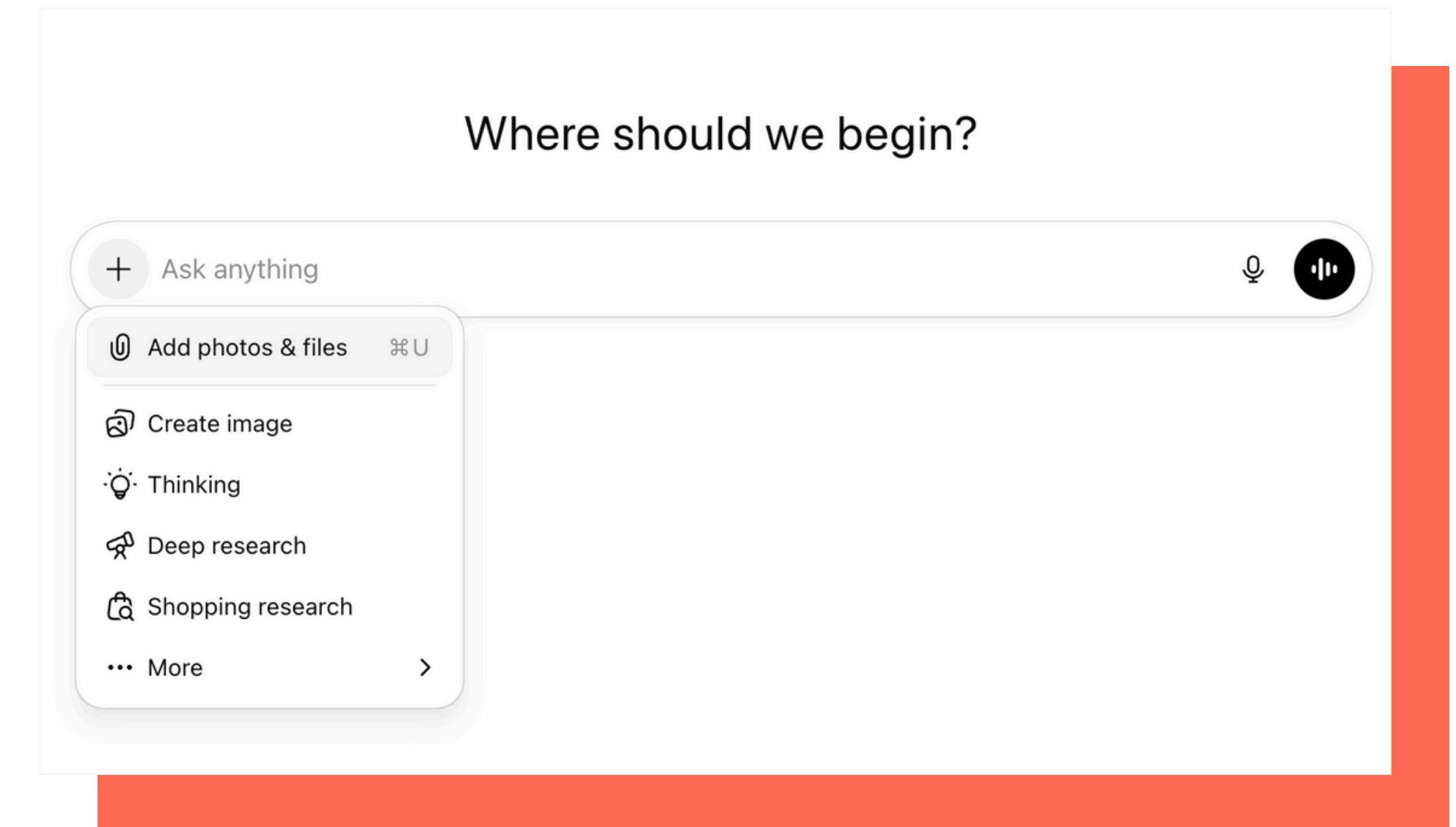
Large Language Models (LLMs) as Transcription Tools

Current Models

ChatGPT, Gemini, Claude

The "Zero-Shot" Approach

You can get a transcription immediately by simply uploading an image to the chat interface and asking the AI to read it. You do not need to "train" the model yourself.



Instructional Design (Prompt Engineering)



Context

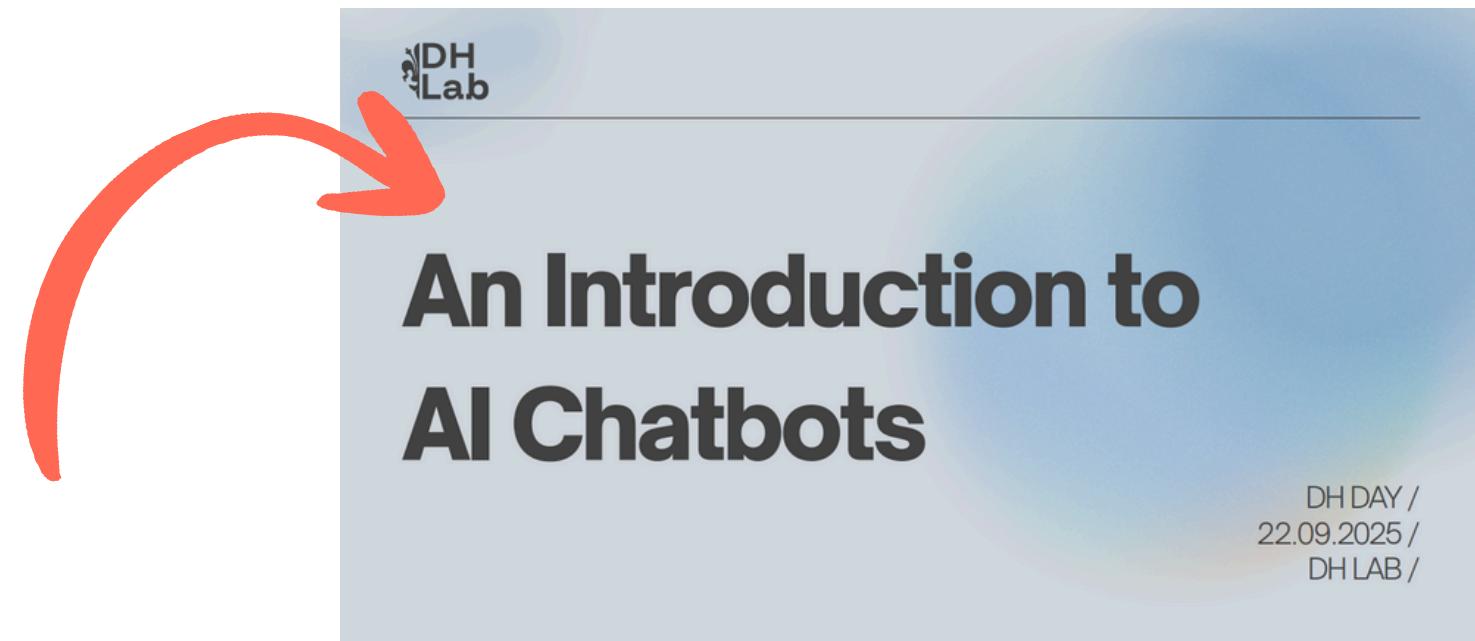
Provide a context description of the document
(e.g. 19th century inventory book in Italian)

Task Specificity

Give clear rules for tricky elements, such as
how to handle abbreviations, symbols, or
letters that look similar.

Output Structuring

Ask the AI to provide the text in a specific
way, such as a simple list, a table, a
structured form (e.g. JSON), or coded
formats like TEI or XML.



Source: An Introduction to AI Chatbots (dhlab.khi.fi.it > Resources > Download Section)

```
{  
  "page": 7,  
  "negative_number": "21901",  
  "artist": "Albani Francesco",  
  "raw_transcription": "21901 Albani Francesco - La Galatea. P.",  
  "catalogue_title": "Dresda. Riproduzioni"  
}
```

Improving Results: Learning by Example

The Value of Examples

Providing the AI with 2-3 lines of text you have already verified acts as a "cheat sheet." This helps e.g. the AI understand the specific handwriting style and your preferred formatting.

Keep it Simple

Clear, direct instructions are usually better than very long, complicated descriptions. The AI performs best when it has a focused task and a few good examples to follow.

Inv.-N.	Künstler.	Gegenstand.	Ort.
7360	Fra Filippo Lippi - Schule	Madonna u Kind	Rom Galleria Colonna
7361	Filippino Lippi	4 Herk.	Lucas



"7360| Fra Filippo Lippi - Schule |
Madonna u Kind | Rom Galleria Colonna"

Case Studies and Evaluation

Case Study: Photographer Sales Catalogues



The Material

Photothek's collection, each contains a list of photographs (generally negative number + short image content description)



162	FIRENZE E DINTORNI.		
<i>Collezione di Pitture del Museo degli Argenti.</i>			
Firenze - Galleria Feroni e Cenacolo di Foligno - Pitture (segue).			
549	La Madonna detta « del Dito ».	Dolei Carlo.	P.
550	« Ecce Homo ».	»	P.
551	L'Arcangelo Gabriele col giglio.	»	A. P. M. E. G.
552	» La Testa (Particolare).	»	P.
553	La Vergine Annunziata.	»	A. P. M. E. G.
554	» La Testa (Particolare).	»	P.
818	Testa del Redentore.	Maratta Carlo.	P.
819	Fiori, una vipera, farfalle e altri insetti.	Marcellis Ottone.	P.
1023	Interno di un'osteria con bottega di Macellarolo.	Teniers David <i>Il Giovane</i> .	P.
Galleria dell'Ospedale degli Innocenti (Vedi Ospizio, pag. 69).			
Galleria Pitti o Palatina. ¹			
Piazza Pitti.			
17076	Vestibolo a terreno del nuovo Scalone di accesso alla Galleria.	Del Moro Luigi.	P.
17077	Scala e Vestibolo d'ingresso della Galleria al primo piano.	»	P.
17078	Il Vestibolo con la Fontana di Donatello.	»	P.
3297	» La Fontana in marmo sormontata da un putto.	Donatello Donato.	P.
1378	Sala dell'Iliade con la Statua della Carità del Bartolini.	A. P.	
1351	» Giove assiso in mezzo ai personaggi dell'Iliade (Affresco nella volta).	Sabatelli Luigi.	P. E.
1352	» Giunone tenta con la seduzione scoprire il pensiero del marito.	»	P.
1353	» Giunone riceve la cintura di Venere per riuscire a sedurre Giove.	»	P.
1354	» Giunone risveglia Morfeo.	»	P.
1355	» Giunone si presenta a Giove.	»	P.
1356	» Nettuno infonde coraggio ad Aiace.	»	P.
1357	» Giove irritato per l'artifizio di Giunone.	»	P.
1358	» Apollo rende la forza ad Ettore.	»	P.
1359	» Ettore combatte Aiace.	»	P.
1375	Sala di Saturno - Lato della Madonna della Seggiola.	A. P. E. G.	
1376	» Lato della Madonna del Granduca.	P.	
1377	» Stucchi della Volta (Particolare).	Ferri Ciro.	P.
Lunette negli Archi della Volta.			
Firenze - Galleria Pitti o Palatina - Sala di Saturno (segue).			
1346	» La Prudenza e Marte presentano un uomo a Saturno perché sia coronato dalla Gloria (Affresco nella Volta).	Berrettini P. da Cortona.	P. E.
1372	Sala di Giove con la Statua della Vittoria del Consani.	A. P.	
1373-74	» Stucchi della Volta - Part. (2 Tav.).	P.	
1345	» Allegoria alla gloria di Cosimo I de' Medici (Affresco nella Volta).	P.	E.
1371a	Sala di Marte - Lato di Papa Giulio II.	P.	
1371	» Stucchi in un angolo della Volta - Part.	P.	
1344	» Il Trionfo della Casa Medici (Affresco nella Volta).	P.	E.
1369	Sala d'Apollo - Lato della Madonna del Murillo.	A. P. E. G.	
1370	» Stucchi della Volta (Part.).	Ferri Ciro.	P.
1343	» Apollo indica a Cosimo la via dell'Immortalità (Affresco nella Volta).	Berrettini P. da Cortona.	P. E.
1368	Sala di Venere - Stucchi della Volta (Part.).	Salvestrini Cosimo.	P
1342	» Minerva toglie a Venere il fanciullo per consegnarlo ad Ercole. - Allegoria a Cosimo I (Affresco nella Volta).	Berrettini P. da Cortona.	P. E.
1380	Sala di Prometeo. - Lato della Bella Simonetta.	P.	
1381	Sala della Giustizia.	P.	
1382	Sala di Flora con la Venere del Canova.	A. P.	
31167	Sala da Bagno decorata dal Pamphilj.	Cacciari Giuseppe.	P.
1379	Sala della Stufa.	A. P. E.	
1347	» L'Età dell'Oro.	Berrettini P. da Cortona.	P.
1348	» L'Età dell'Argento.	Affreschi	P.
1349	» L'Età del Rame.	»	P.
1350	» L'Età del Ferro.	»	P.
Mobili.			
1364	Stipo in ebano con decorazioni.	Arte Tedesca (s. XVII).	P.
Sculpture.			
1362	La Carità. - Gruppo in marmo.	Bartolini Lorenzo.	A. P. E.
1363	Napoleone I. - Busto in marmo.	Canova Antonio.	P.
1365	Venere uscente dal Bagno. - Vista di fronte.	»	A. P. E. G.
1366	» - Vista da tergo.	»	A. P. E.
1366a	» - La Testa (Part.).	»	P.
1367	La Vittoria.	Consani Vincenzo.	A. P. E.
Pitture. ¹			
1	L'Apparizione di Gesù alla Vergine.	Albani Francesco.	P.
2	Santa Famiglia e due Angioli.	»	P.
¹ Per il Palazzo Pitti - Vedi pag. 75. Per il Museo degli Argenti - Vedi Palazzo Pitti, pag. 79.			
I soggetti contrassegnati con asterisco (*) si trovano negli Uffici della Galleria.			

Digitized by srujanika@gmail.com

Source: Alinari: "Firenze e Dintorni. Riproduzioni Fotografiche", 1916, p. 2, 94.

Case Study: Photographer Sales Catalogues



Challenges

- Printed lists with variable structure and layout (columns, tables, linear)
- Variable length (Between 10 and 200 pages per catalogue)
- Distinction between pages with and without photograph entries
- Inconsistencies, abbreviations, ditto marks, etc.

Source: Bruckmann, Friedrich: "Bruckmanns Pigmentdrucke der Gemälde-Galerie des Städelschen Kunstinstitutes in Frankfurt a. M.", 1899, p. 4.

Städelsches Kunstinstitut in Frankfurt a. M.	
4	Städels-Nr.
122	Brueghel d. Ält., Jan. — Verspottung der Latona.
94	Bruyn, Barth. de. — Männliches Bildnis.
95	— Männliches Bildnis.
96	— Weibliches Bildnis.
4581	Burger, Anton — Der Römerberg zu Frankfurt a. M.
523	— Der alte Kutscherhof zu Frankfurt a. M.
525	— Häusliche Andacht.
581	Burnitz, Karl Peter. — Cronberg.
464	Calame, Alexandre. — Schweizerlandschaft.
51	Canaletto. — Der Canal Grande zu Venedig.
52	— Der Dogenpalast zu Venedig.
4	A. Nach Künstlernamen geordnet.
5	Städels-Nr.
143	Coello, Cl. — Karl II. von Spanien.
22	Dyck, Antonius van. — Halbfigur eines jungen Mannes, mit Brief.
144a	Correggio. — Madonna mit Kind und h. Johannes.
188	Cranach, Lucas. — Maria mit dem Kinde.
337	— Cranach, Lucas. — Kreuzigung Christi.
338	— DasGastmahl des Herodes.
339	— Venus
41	Cristus, Petrus. — Maria mit Kind, hh. Hieronymus und Franz von Assisi.
261	— (Detail) — Brustbild der Madonna.
98	Crivelli, Carlo. — Erzengel Gabriel.
33	— Heilige Maria.
34	Cuijp, Aelbert. — Schafherde auf der Weide.
196	— (Detail) — Brustbild der Madonna.
173	Fabritius, Bernaert. — Geburt Johannes d. T.
174	— Schafherde auf der Weide.

Carlo Naya fotografo editore - Venezia		Carlo Naya fotografo e	
NUMERO DELLA FOTOGRAFIA	Formati	NUMERO DELLA FOTOGRAFIA	Formati
Foglio 43×58 1/2 Foglio 28×38 Placca 20×26 Gabinetto 10×13	Le più complete collezioni di Quadri - Affreschi - Vedute Stature Dettagli d'architettura di tutta l'Italia	Foglio 43×58 1/2 Foglio 28×38 Placca 20×26 Gabinetto 10×13	Le più complete collezioni di Quadri - Affreschi - Vedute Stature Dettagli d'architettura di tutta l'Italia
12	CATALOGO DELLE RIPRODUZIONI dei Quadri e Affreschi esistenti nelle CHIESE DI VENEZIA	12	CATALOGO dei Quadri e CHIES
921 a	»	921 b	»
921 c	»	922	»
920	»	920	»
1907	»	1907	»
Chiesa di Santa Maria Formosa (segue)			
921 a	»	921 b	»
921 c	»	922	»
920	»	920	»
1907	»	1907	»
Chiesa di Santa Maria Gloriosa dei Frari			
1120b	»	1214	»
1120e	»	1847	»
1120f	»	1848	»
908	»	908 a	»
908 b	»	1842	»
908 c	»	908 b	»
1843	»	908 c	»
Bellini Giovanni			
1120	»	1120a	»
1120d	»	1120c	»
1213	»	1213	»
Formati Grandissimi vedi fine Catalogo			
1841	»	1883	»
1884	»	1885	»
1886	»	1887	»
1888	»	1889	»
1890	»	1891	»
1892	»	1893	»
1894	»	1895	»
1896	»	1897	»
1898	»	1899	»
1900	»	1901	»
1902	»	1903	»
1904	»	1905	»
1906	»	1907	»
1908	»	1909	»
1910	»	1911	»
1912	»	1913	»
1914	»	1915	»
1916	»	1917	»
1918	»	1919	»
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1922	»	1923	»
1924	»	1925	»
1926	»	1927	»
1928	»	1929	»
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1952	»	1953	»
1954	»	1955	»
1956	»	1957	»
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1962	»	1963	»
1964	»	1965	»
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2075	»	2076	»
2076	»	2077	»
2077	»	2078	»
2078	»	2079	»
2079	»	2080	»
2080	»	2081	»
2081	»	2082	»
2082	»	2083	»
2083	»	2084	»
2084	»	2085	»
2085			

Case Study: Photographer Sales Catalogues

Workflow (Gemini API)

Instead of typing each page into a chat, we use an "API" (a direct connection) to send hundreds of images to the AI at once. The AI reads them and automatically organizes the information into a digital file.

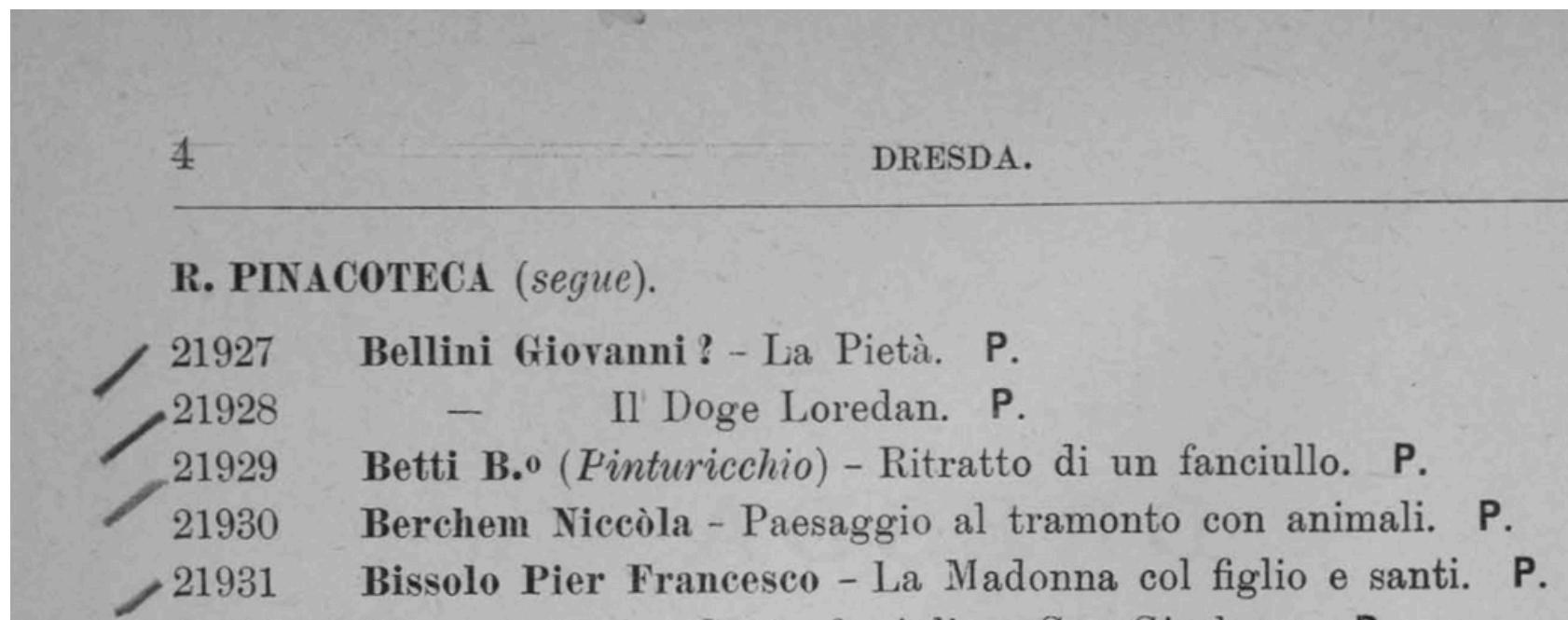
Goal

To create a searchable database where we can instantly sort entries by artist, date, or category.

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{  
  "page": 4,  
  "negative_number": "21927",  
  "location": [  
    "DRESDA.",  
    "R. PINACOTECA (segue)."  
  ],  
  "artist": "Bellini Giovanni?",  
  "subject": [  
    "Bellini Giovanni?",  
    "La Pietà"  
  ],  
  "raw_transcription": "21927 Bellini Giovanni? - La Pietà. P.",  
  "resolved_transcription": "21927 Bellini Giovanni?, La Pietà. DRESDA. R.  
  PINACOTECA (segue).",  
  "formats": "P.",  
  "notes": "",  
  "catalogue_title": "Dresda. Riproduzioni",  
  "filename": "Alinari_1906_2",  
  "publisher": "ALINARI",  
  "year": "1906",  
  "places": [  
    {  
      "id": "cebe9b5c-1d41-4f08-8239-e9cee52b8e4a",  
      "geoNamesId": 3176959,  
      "itName": "Firenze",  
      "enName": "Florence",  
      "deName": "Florenz",  
      "createdAt": "2023-11-29T23:45:48.219Z",  
      "updatedAt": "2023-11-29T23:45:48.219Z"  
    }  
  ],  
  "prompt_version": "extraction_prompt_v1",  
  "prompt_author": "author1",  
},
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Case Study: Photographer Sales Catalogues



Source: Alinari: "Dresda, Dintorni", 1906, p. 5.

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Choosing the Right Tool



Effort vs. Results

Is it worth spending weeks training a custom model in Transkribus, or is a quick AI chat good enough for a few pages?

The Need for Human Oversight

All AI can "hallucinate" (make up words that aren't there). For academic work, a human must always check the final transcript for accuracy.

Size of the Collection:

Small collections: Use chat interfaces (ChatGPT/Gemini).
Large archives: Use automated API processing or Transkribus models.

Main Takeaway

Match your tool to your project. Use OCR for modern print, Transkribus for large sets of the same handwriting, and LLMs for quick results or complex data.

THANK YOU!

<https://www.transkribus.org/>

<https://chatgpt.com/>

<https://gemini.google.com/app>

<https://claude.ai/>