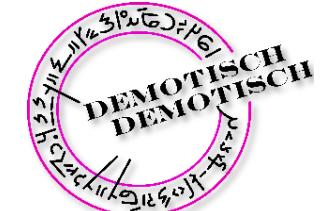


# Deciphering Demotic Digitally

**The Demotic Palaeographical Database Project – DPDP**

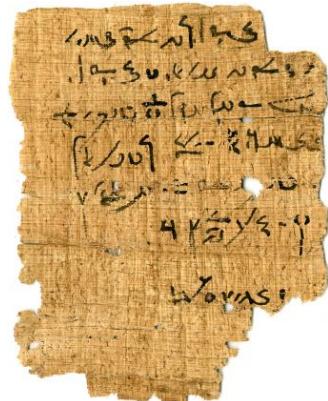
**Claudia Maderna – Fabian Wespi – Jannik Korte**

**Egyptological Institute – University of Heidelberg**



## towards creating a Demotic palaeography...

### PALAEOGRAPHICAL RESEARCH



DATE

PROVENANCE

COMPOSITION OF FRAGMENTS

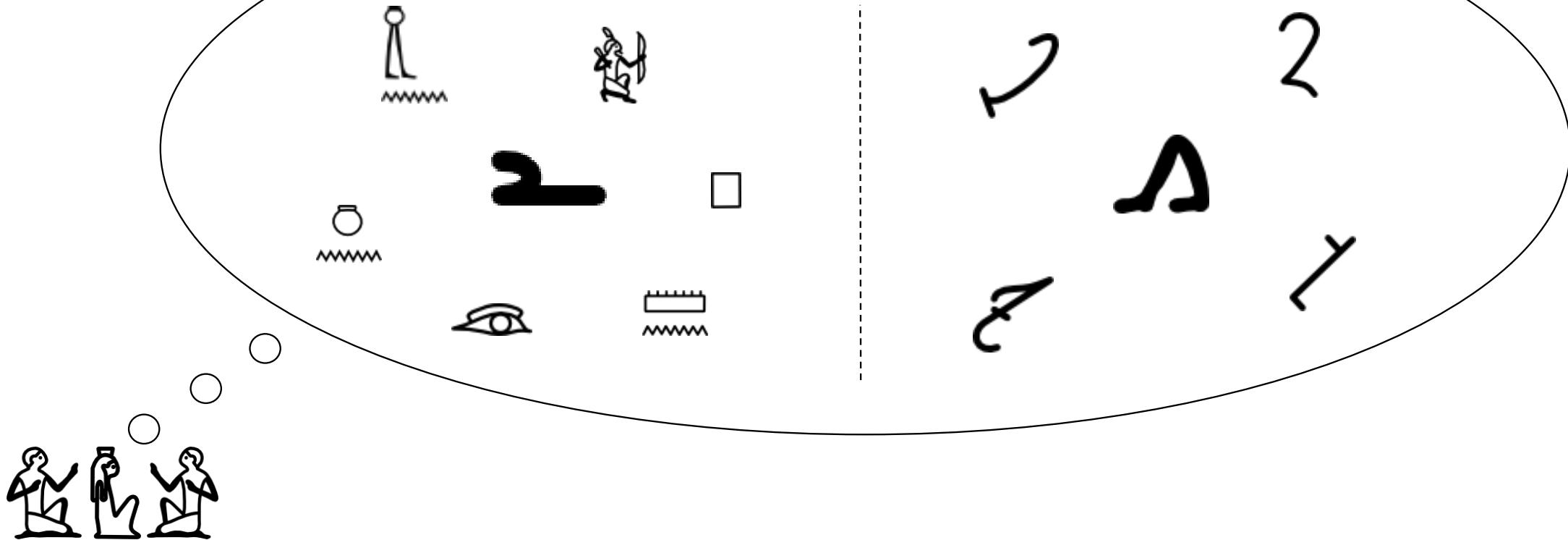
COMPARISON OF HANDS



Abbildung: P. Heid. Inv. Dem. 750 a – © Institut für Papyrologie, Ruprecht-Karls-Universität Heidelberg. <http://zaw-papy.zaw.uni-heidelberg.de/fmi/xsl/Demotisch/home.xsl>

**One Demotic sign – many hieroglyphic predecessors. One hieroglyph – many Demotic representations.**

## DEMOTIC SCRIPT



## Hieratic vs Demotic published palaeographies.

# PALAEOGRAPHIES

HIERATIC

DEMOTIC



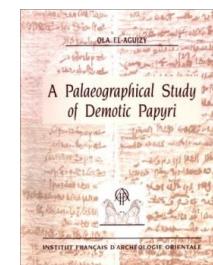
MÖLLER  
1927-36



WIMMER  
1995



VERHOEVEN  
2001



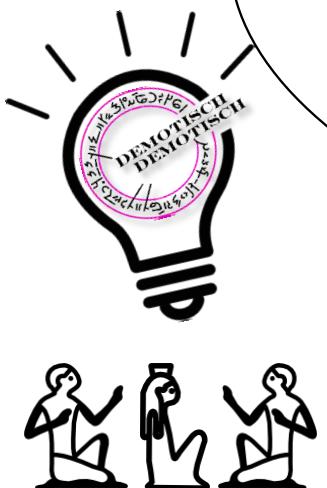
EL-AGUIZY  
1998



## towards creating a Demotic palaeography...

### WHAT WE WANT...

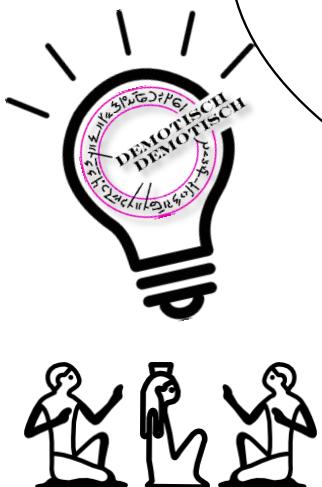
- UNRESTRICTED CORPUS
- DATA ACQUISITION DOWN TO WORD- AND SIGN LEVEL
- CONFIRMABILITY OF READINGS
- WORD ORTHOGRAPHY
- UPDatability



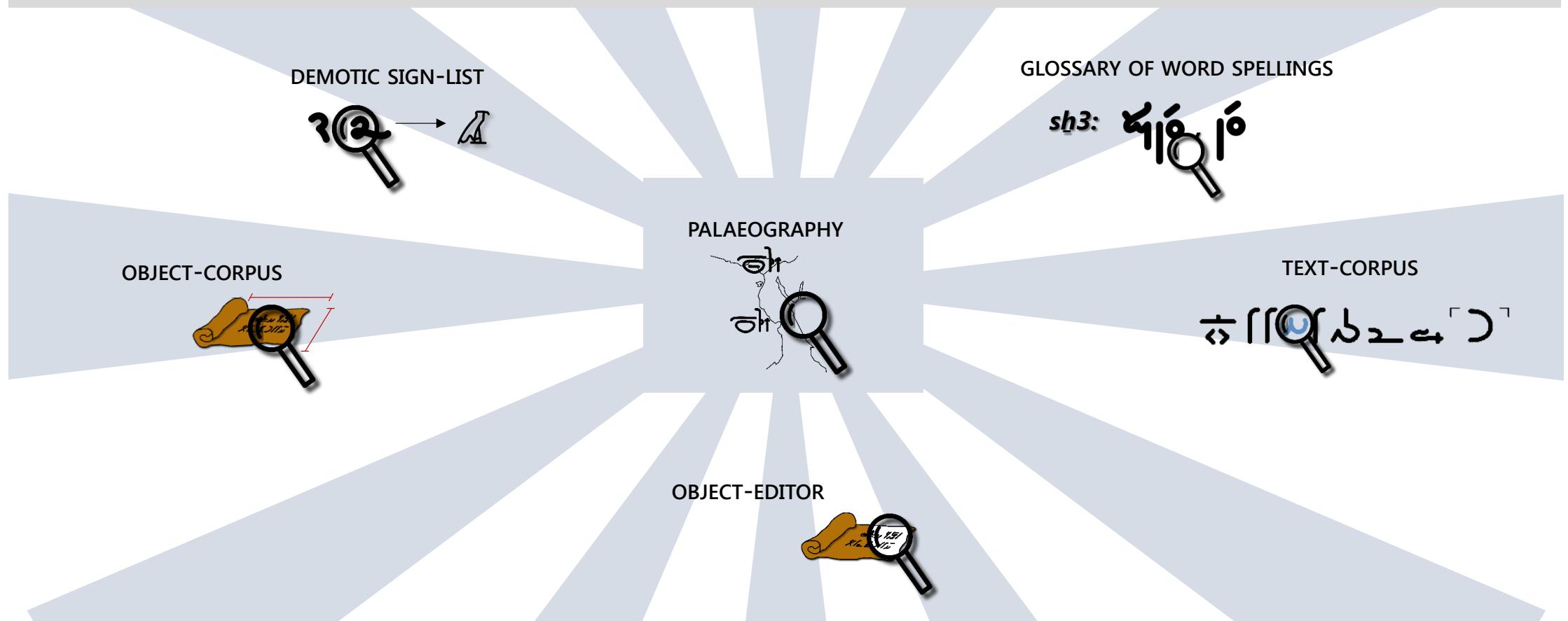
## towards creating a Demotic palaeography...

### WHAT WE ALSO WANT...

- EXTENSIVE SEARCH OPTIONS (DEMOTIC SIGNS, GRAMMAR, COMBINATIONS)
- DYNAMIC FILTERING (TIME, LOCATION, TEXTTYPE)
- BIG ENOUGH CORPUS WHILE SPECIAL FORMS
- RESEARCH OPTIONS: SINGLE TEXT vs CORPUS
- AUTOMATIC MATCHING OF SIGN-REPERTOIRES



## analysis functions



decipher...

DEMOTIC SIGN-LIST



Look up signs , formal or  
phonetic equivalences and  
clusters of signs

DEMOTIC SIGN-LIST

① manuelle Eingabe ② Eingabe per Bild ③ Eingabe per Lautwert

Das könnte eines der folgenden Zeichen sein:

1 < 2 < 3 <

4 < 5 < 6 <

7 < 8 < 9 <

10 < 11 < 12 <

13 < 14 < 15 <

16 < 17 < 18 <

19 < 20 < 21 <

22 < 23 < 24 <

25 < 26 < 27 <

28 < 29 < 30 <

31 < 32 < 33 <

34 < 35 < 36 <

37 < 38 < 39 <

40 < 41 < 42 <

43 < 44 < 45 <

46 < 47 < 48 <

49 < 50 < 51 <

52 < 53 < 54 <

55 < 56 < 57 <

58 < 59 < 60 <

61 < 62 < 63 <

64 < 65 < 66 <

67 < 68 < 69 <

70 < 71 < 72 <

73 < 74 < 75 <

76 < 77 < 78 <

79 < 80 < 81 <

82 < 83 < 84 <

85 < 86 < 87 <

88 < 89 < 90 <

91 < 92 < 93 <

94 < 95 < 96 <

97 < 98 < 99 <

100 < 101 < 102 <

103 < 104 < 105 <

106 < 107 < 108 <

109 < 110 < 111 <

112 < 113 < 114 <

115 < 116 < 117 <

118 < 119 < 120 <

121 < 122 < 123 <

124 < 125 < 126 <

127 < 128 < 129 <

130 < 131 < 132 <

133 < 134 < 135 <

136 < 137 < 138 <

139 < 140 < 141 <

142 < 143 < 144 <

145 < 146 < 147 <

148 < 149 < 150 <

151 < 152 < 153 <

154 < 155 < 156 <

157 < 158 < 159 <

160 < 161 < 162 <

163 < 164 < 165 <

166 < 167 < 168 <

169 < 170 < 171 <

172 < 173 < 174 <

175 < 176 < 177 <

178 < 179 < 180 <

181 < 182 < 183 <

184 < 185 < 186 <

187 < 188 < 189 <

190 < 191 < 192 <

193 < 194 < 195 <

196 < 197 < 198 <

199 < 200 < 201 <

202 < 203 < 204 <

205 < 206 < 207 <

208 < 209 < 210 <

211 < 212 < 213 <

214 < 215 < 216 <

217 < 218 < 219 <

220 < 221 < 222 <

223 < 224 < 225 <

226 < 227 < 228 <

229 < 230 < 231 <

232 < 233 < 234 <

235 < 236 < 237 <

238 < 239 < 240 <

241 < 242 < 243 <

244 < 245 < 246 <

247 < 248 < 249 <

250 < 251 < 252 <

253 < 254 < 255 <

256 < 257 < 258 <

259 < 260 < 261 <

262 < 263 < 264 <

265 < 266 < 267 <

268 < 269 < 270 <

271 < 272 < 273 <

274 < 275 < 276 <

277 < 278 < 279 <

280 < 281 < 282 <

283 < 284 < 285 <

286 < 287 < 288 <

289 < 290 < 291 <

292 < 293 < 294 <

295 < 296 < 297 <

298 < 299 < 300 <

301 < 302 < 303 <

304 < 305 < 306 <

307 < 308 < 309 <

310 < 311 < 312 <

313 < 314 < 315 <

316 < 317 < 318 <

319 < 320 < 321 <

322 < 323 < 324 <

325 < 326 < 327 <

328 < 329 < 330 <

331 < 332 < 333 <

334 < 335 < 336 <

337 < 338 < 339 <

340 < 341 < 342 <

343 < 344 < 345 <

346 < 347 < 348 <

349 < 350 < 351 <

352 < 353 < 354 <

355 < 356 < 357 <

358 < 359 < 360 <

361 < 362 < 363 <

364 < 365 < 366 <

367 < 368 < 369 <

370 < 371 < 372 <

373 < 374 < 375 <

376 < 377 < 378 <

379 < 380 < 381 <

382 < 383 < 384 <

385 < 386 < 387 <

388 < 389 < 390 <

391 < 392 < 393 <

394 < 395 < 396 <

397 < 398 < 399 <

400 < 401 < 402 <

403 < 404 < 405 <

406 < 407 < 408 <

409 < 410 < 411 <

412 < 413 < 414 <

415 < 416 < 417 <

418 < 419 < 420 <

421 < 422 < 423 <

424 < 425 < 426 <

427 < 428 < 429 <

430 < 431 < 432 <

433 < 434 < 435 <

436 < 437 < 438 <

439 < 440 < 441 <

442 < 443 < 444 <

445 < 446 < 447 <

448 < 449 < 450 <

451 < 452 < 453 <

454 < 455 < 456 <

457 < 458 < 459 <

460 < 461 < 462 <

463 < 464 < 465 <

466 < 467 < 468 <

469 < 470 < 471 <

472 < 473 < 474 <

475 < 476 < 477 <

478 < 479 < 480 <

481 < 482 < 483 <

484 < 485 < 486 <

487 < 488 < 489 <

490 < 491 < 492 <

493 < 494 < 495 <

496 < 497 < 498 <

499 < 500 < 501 <

502 < 503 < 504 <

505 < 506 < 507 <

508 < 509 < 510 <

511 < 512 < 513 <

514 < 515 < 516 <

517 < 518 < 519 <

520 < 521 < 522 <

523 < 524 < 525 <

526 < 527 < 528 <

529 < 530 < 531 <

532 < 533 < 534 <

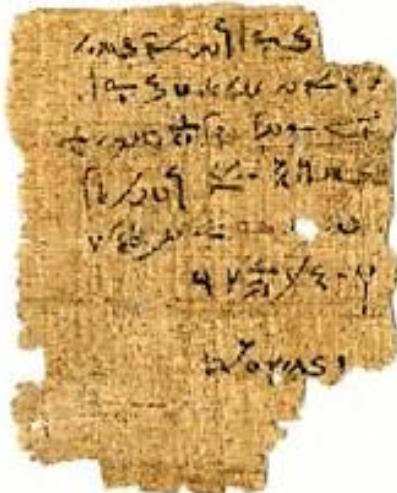
535 < <img alt

## review...

PAPYRUS-EDITOR



**Look up image,  
transcriptions and  
transliteration**



- (1) NN p̪ nt̪ qđ | tw̪y lr̪ n n̪ sm̪' n NN s̪'
  - (2) NN p̪ l̪m̪-r̪'-m̪s̪' h̪l̪.t̪ n kmy
  - (3) l̪rm̪ NN s̪' N̪ n̪ht̪-Hr̪ p̪ l̪m̪-r̪'-m̪s̪'
  - (4) h̪l̪ t̪ n kmy m-b̪h Mnt̪ p̪ nt̪ ? | nt̪ iw̪ -t̪ r̪ d̪t̪ |
  - (5) ſ̪sp̪ n̪ (n̪)-d̪t̪ -t̪n̪ mt̪ nb n̪.m̪k | Htr̪
  - (6) [...] | nt̪ iw̪ -t̪ r̪ l̪n̪-n̪k p̪l̪ b̪k |
  - (7) [...] r̪db n̪ ht̪n̪ 2 |



Abbildung: P. Heid. Inv. Dem. 750 a – © Institut für Papyrologie, Ruprecht-Karls-Universität Heidelberg. <http://zaw-papy.zaw.uni-heidelberg.de/fmi/xsl/Demotisch/home.xls>



## compare and classify...

### PALAEOGRAPHY



**Look up shapes of signs;  
locate a scribal hand in  
time and space**

Zeichen		Unterschrift		Quellen	
Bekl.	Det.	I	II	I	II
t	t	s	s	b	b
/	/	x	x	λ	λ
-	-	v	v	v	v
4	4	5	5	5	5
3	3	3	3	4	4
C	C	o	o	o	o

The screenshot shows a digital interface for deciphering Demotic script. A context menu is open over a specific character 't' in the first row, second column. The menu items are: 'f A w', '11 h', 'f f h', '2 6', '11 sn', '2 1 imn(t)', and '1 f imn(t)'. The background shows a grid of other Demotic characters and their corresponding transcription forms. At the bottom, there is a navigation bar with a play button, a progress bar indicating '00:04,19', and a volume icon.

GLOSSARY OF SPELLINGS

decipher and classify...



Look up spellings of a word and find similar hands

The screenshot shows a digital interface for deciphering Demotic handwriting. At the top, there is a toolbar with buttons for 'Zeichen' (Characters), 'Umschrift' (Transcription), and search options ('Teil', 'Wortanfang', 'Wortende', 'End'). Below the toolbar, the search term 'zufrieden sein, zustimmen' is entered, along with its definition '(Verb)'. Underneath the definition, two examples of Demotic handwriting are shown, each with a small image of the original tablet fragment. A progress bar at the bottom indicates the video is at 00:16.48 seconds.

zufrieden sein, zustimmen  
(Verb)

.4ju 53, 42 153

mtl

zufrieden sein, zustimmen  
(Verb)

.4ju 53, 42 153

00:16.48

## decipher and classify...

TEXT-CORPUS



**Look up phrases  
and find similar  
constructions**

Wortauswahl: s      Suchbegriffe: dd p3

s (sie)	Pap. Heid. inv. D 750 a recto Kolumne I Ergänzung [ ] [NN p3 ntl dd] "NN ist derjenige, der spricht"
s3 (Mann, Person)	Pap. Heid. inv. D 722 recto I 1 + 2 — Pa-mah s3 Pa-tw p3 ntl dd n "Pamenech, Sohn des Patu, ist derjenige, welcher spricht zu"
s3 (Sohn)	
s3 (Schutz, Amulett, Hüter)	
sw-27 (Tag 27)	
swr (trinken)	
sp-2 (zweimal, doppelt)	
sym (sm-Kraut, Heu, Gras, Futter (siehe sm 727))	
sm (sm-Kraut, Heu, Gras, Futter (siehe sm 836))	
smy (Meldung, Klage)	

▶ 00:17,74 🔍

## annotate and read...

PAPYRUS-EDITOR



papyri as digital  
editions

The screenshot shows a digital edition of a Demotic papyrus fragment. The main area displays the ancient script on a textured, yellowish-brown background. A magnifying glass icon is positioned over the first few lines of text. Below the image, a transcription of the text is shown in a modern script: ".| ٣ ٥ ٦ ٧ ٨ ٩ ١٠ ١١ [.]". Underneath this transcription, the original Demotic characters are visible. At the bottom of the screen, there is a toolbar with various icons and buttons, including a play button, a timestamp of "01:19:47", and a volume control icon.

Kolumnen	Zeile x+2	+/- Kolumne	+/- Zeile	Kolumneninformationen	Zeileninformationen
Transliteration:	Übersetzung: [und den NN], Sohn des Nechthmonthes, der General			Beginn einer syntaktischen Einheit	Ende einer syntaktischen Einheit
<input type="checkbox"/> NN <sup>1</sup> (NN) Personenname mask. [ ]	<input type="checkbox"/> Ᵽ <sup>2</sup> (Sohn) Substantiv maskulin [ ]	<input type="checkbox"/> Ᵽ <sup>3</sup> Nechthmonthes Personenname mas... [ ]	<input type="checkbox"/> Ᵽ <sup>4</sup> bestimmter Artikel ... [ ]	<input type="checkbox"/> Ᵽ <sup>5</sup> Imfr <sup>2</sup> m <sup>3</sup> (Heeresvorsteher, Ge... Substantiv maskulin [ ]	

Abbildung: P. Heid. Inv. Dem. 750 a – © Institut für Papyrologie, Ruprecht-Karls-Universität Heidelberg. <http://zaw-papy.zaw.uni-heidelberg.de/fmi/xsl/Demotisch/home.xls>

# create glossaries and facsimiles



**create facsimiles  
and a glossary**

The screenshot shows a digital manuscript viewer with the following features:

- Toolbar:** Includes icons for zoom, crop, and other document operations.
- Glossar:** A sidebar listing terms like "unklar", "Priester", "existieren", "[neg. Perf.] geben", "ihm; in ihm", "ihm", and "indem, wobei".
- Text Grid:** A main area displaying a grid of handwritten text fragments (e.g., "639", "112", "33-11") and their digital transcriptions (e.g., "unklar", "Priester", "existieren"). Each fragment has a bounding box and two columns for transcription.
- Transliteration:** A field at the bottom left for entering transliterations.
- Export Dialog:** An open dialog titled "Adobe Export PDF" with options to convert the document to Microsoft Word or Excel, choose a file ("Pap Florenz PSI..102 [713]-15.pdf"), set output language ("Deutsch"), and a "Konvertieren" (Convert) button.
- Timeline:** A small timeline at the bottom right showing progress from 01:20,03.

## the two essential substructures



### DEMOTIC SIGN-LIST



86	047				Logogramm
87	160				Mehrkonsonantenzeichen
88	115				Logogramm
89	103				enklitisches Zeichen [bei Namen]
90	771				enklitisches Zeichen
91	753				Logogramm
92	752				Mehrkonsonantenzeichen
93	754				Mehrkonsonantenzeichen
94	748				Mehrkonsonantenzeichen, Determinativ [Ex]
95	526				Einkonsonantenzeichen [kommen iw-Gruppe]
96	104				Logogramm [Plural, Suffix, Qualitativ]

## LIST OF WORD SPELLINGS

**the two essential substructures**

*sh3: ⲉ|ⲓ ⲍ*



wpy.t	Fest, Feststimmung	Substantiv feminin	ሠጥቃቻቸት
-------	--------------------	--------------------	--------

wn-n3.w	[Imperfekt]	Konverter Imperfekt	2 3
---------	-------------	---------------------	-----

wn-n3y	[Imperfekt]	Konverter Imperfekt	1   2 3
--------	-------------	---------------------	---------

wh3	suchen, wünschen, verlangen, sich sehnen, lieben, [Inf.:] Wunsch, Verlangen	Verb	ሣረጋጥ, ሣረጋጥ
-----	---	------	------------

Wslr	Osiris	Substantiv Goettername maskulin	ወሮስ
------	--------	---------------------------------	-----

wd3	unversehrt sein, gedeihen, (transitiv) schützen, sichern	Verb	ሣጥነት
-----	--	------	------

b3k	Urkunde, Schriftstück	Substantiv maskulin	የጽ
-----	-----------------------	---------------------	----

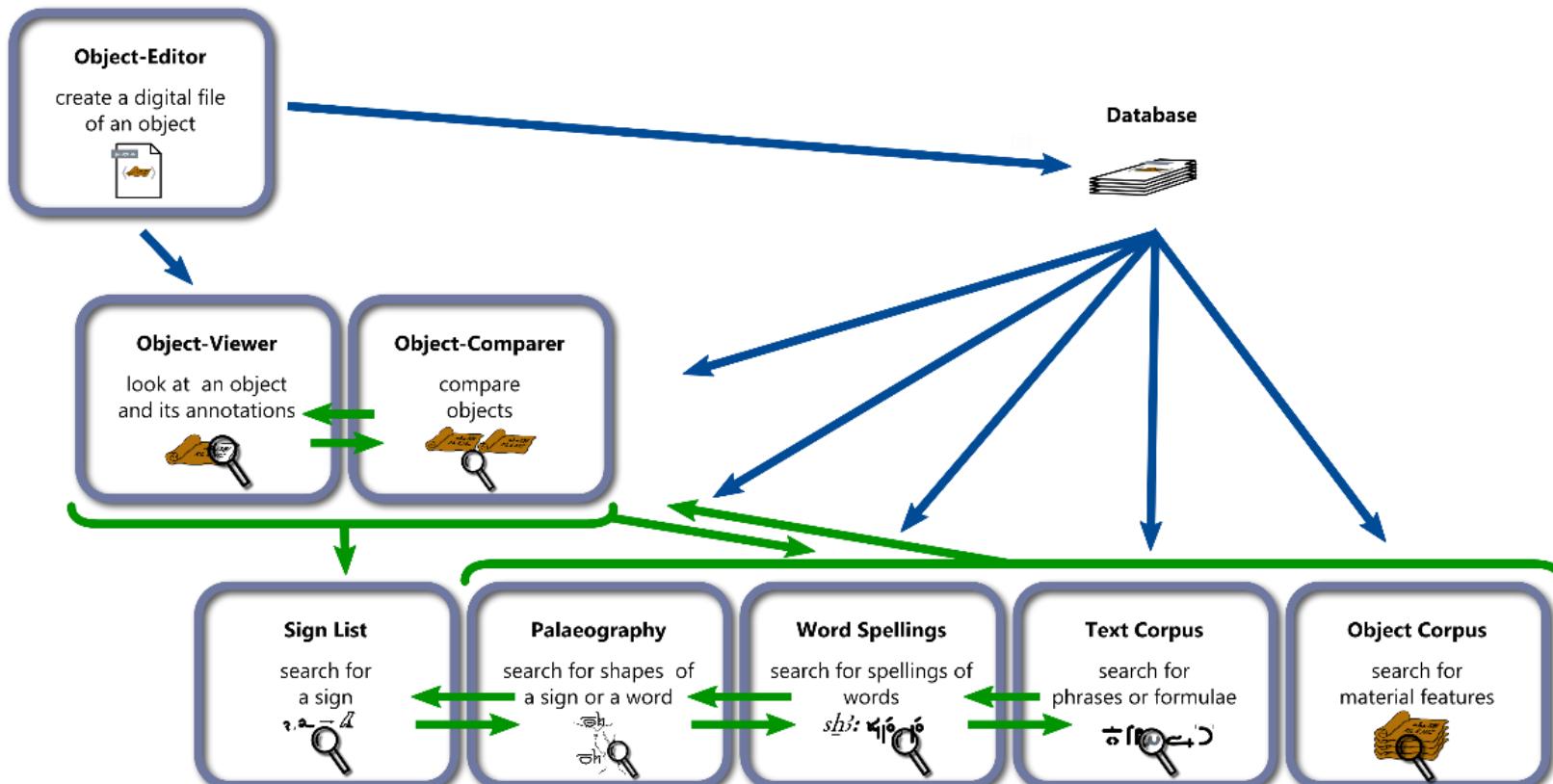
bw-lrl	nicht können, damit nicht [Negation des Aorist]	Negation	ሱልሱል
--------	---	----------	------

## Part III: the conceptual and methodological background

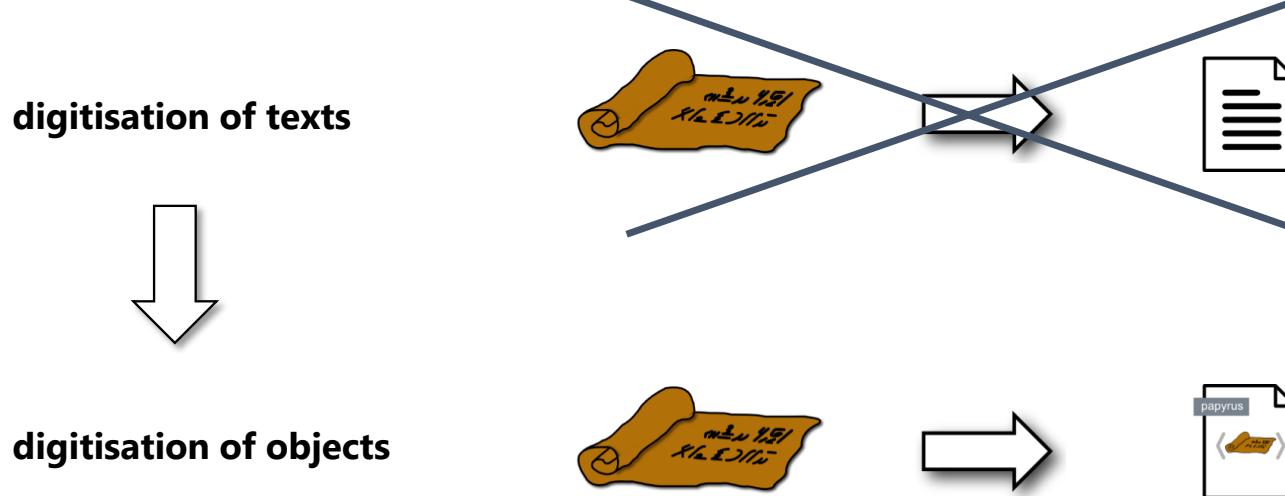
**create a dynamic, comprehensive, efficient and interlinked digital tool  
addressing palaeographical, orthographical, phraseological and material questions  
which might concern a Demotist working on demotic papyri.**

- conceptual framework of the project
- data handling
- methods of collecting and sharing information

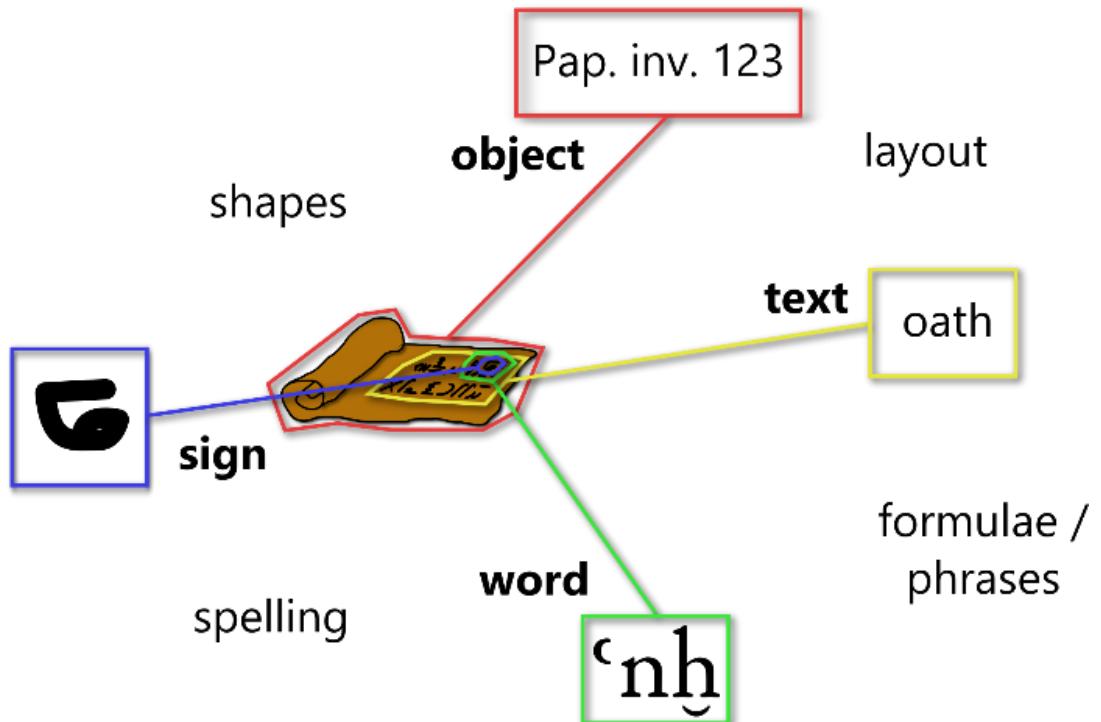
## the concept



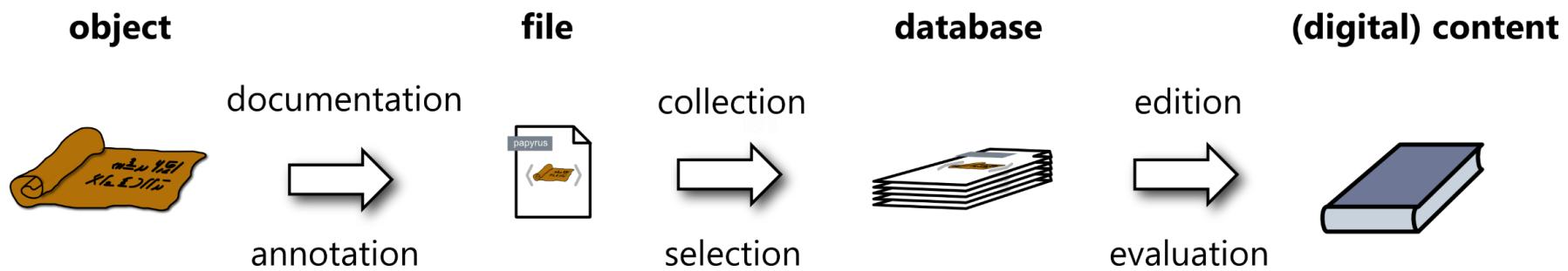
## creating digital facsimiles of artefacts



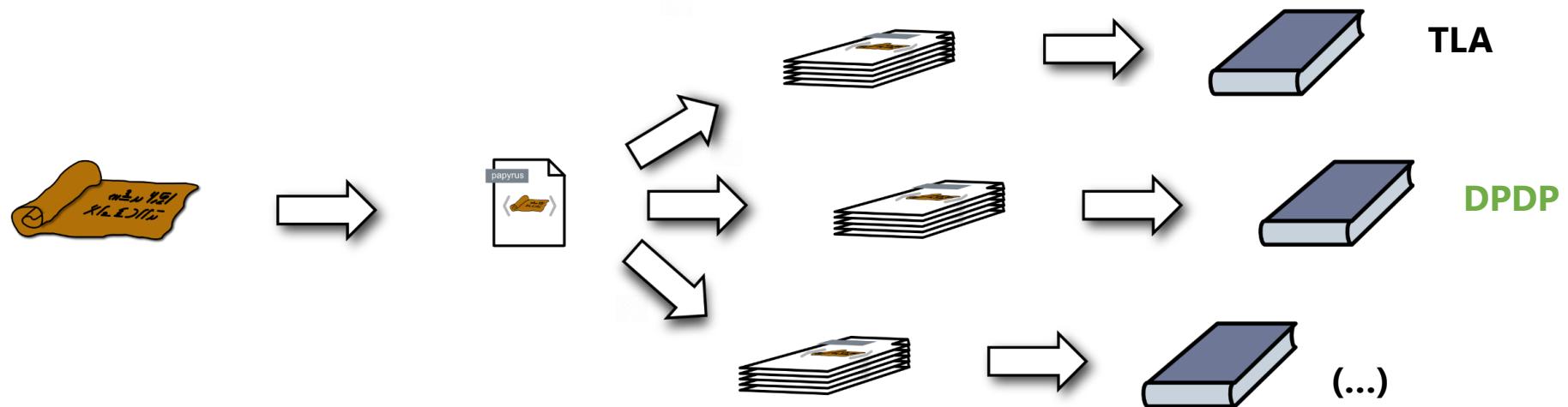
## data annotation



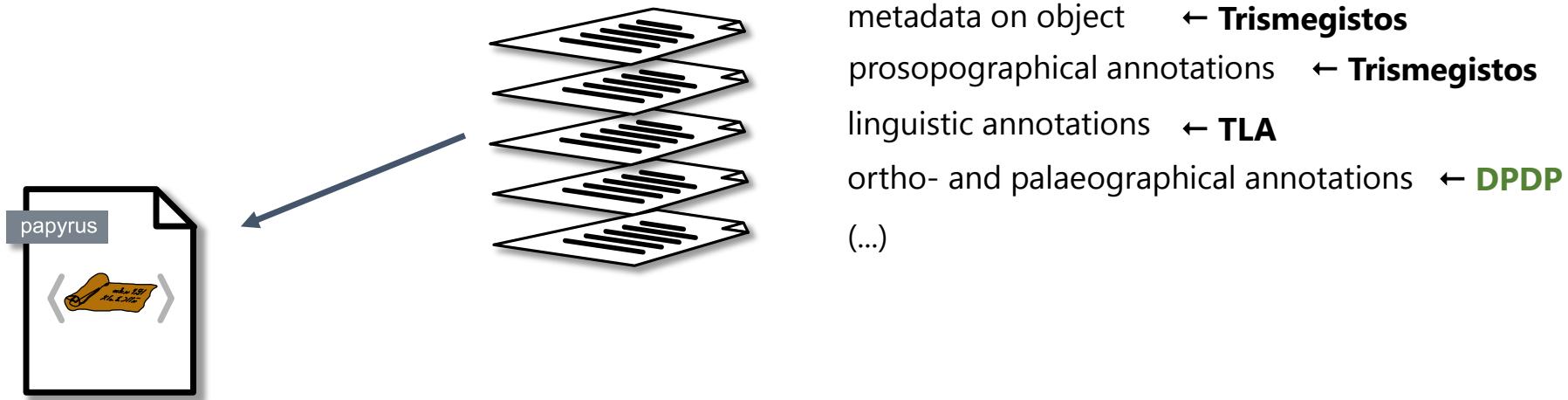
## collecting and analysing data



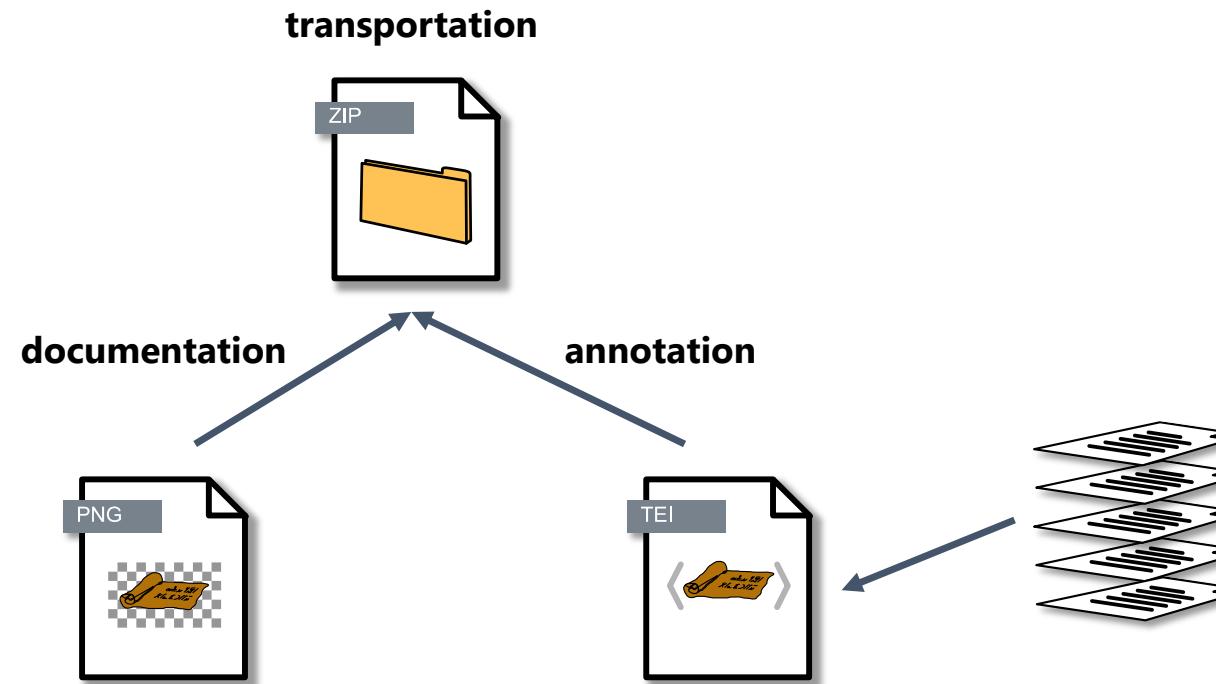
## data sharing



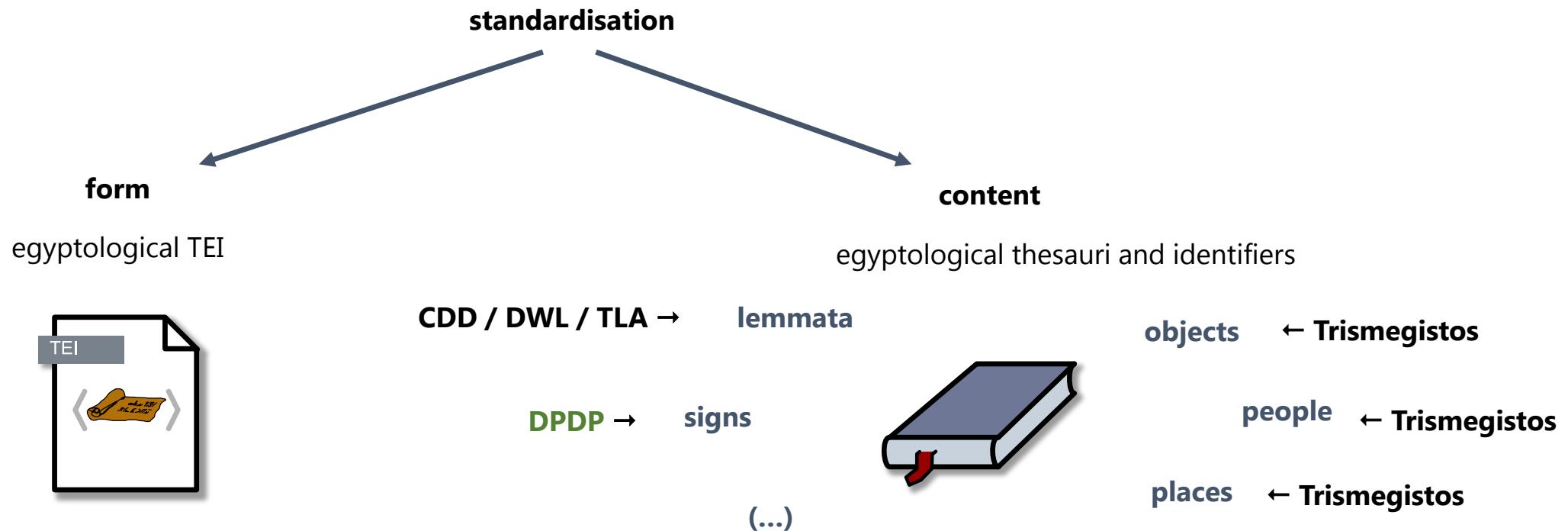
## data enrichment



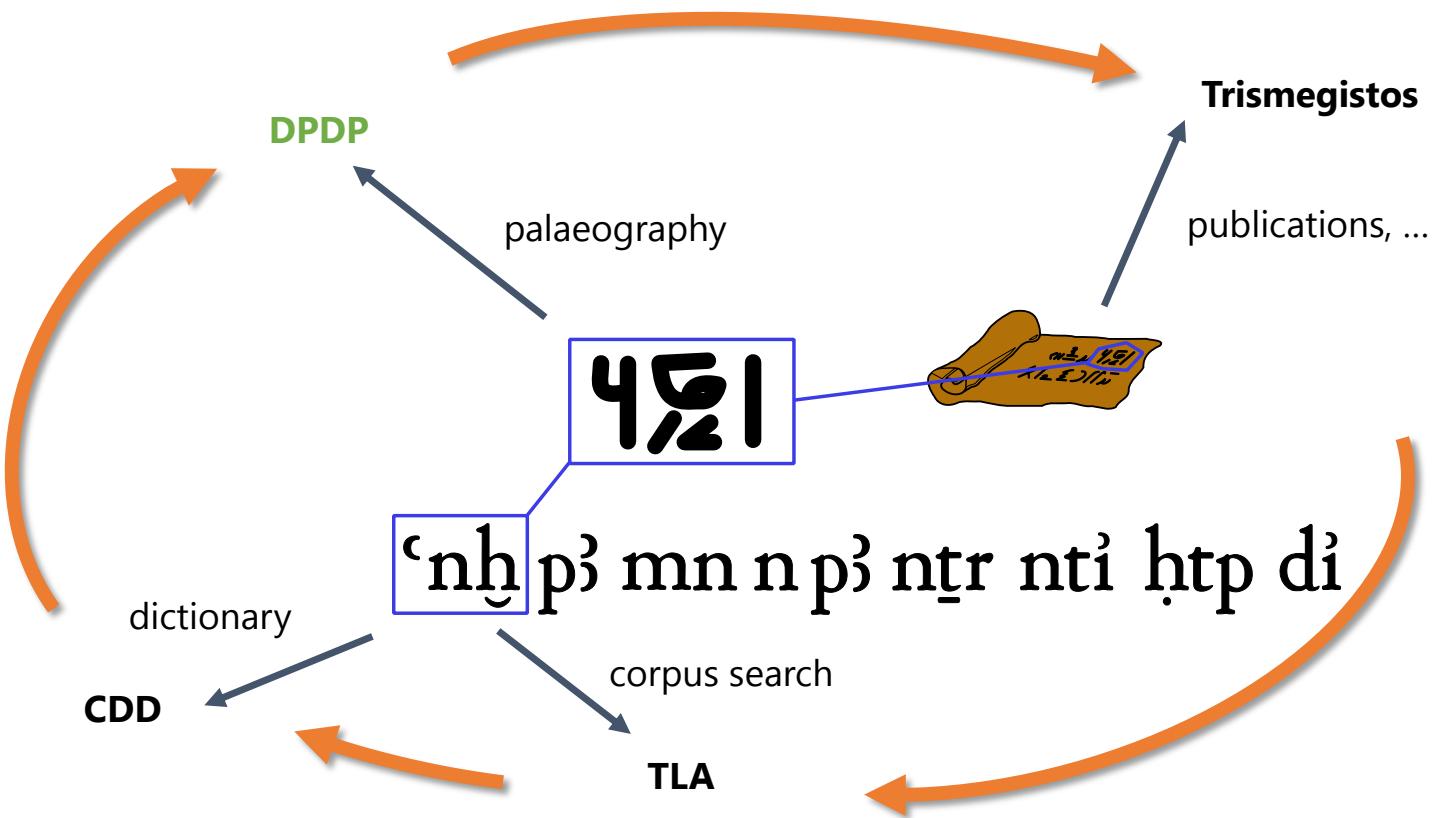
## one file to rule them all



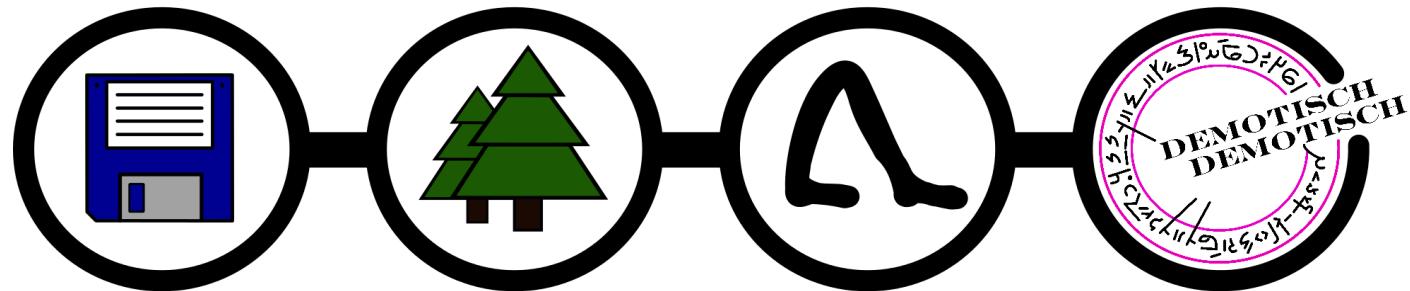
## data normalisation



## data interlinking



Thank you!



**save the forest. go digital.**

 Demotisch Demotisch