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An accessible and transparent pipeline for publishing historical egodocuments

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An accessible and transparent pipeline for publishing historical egodocuments

What's Past is Prologue : The NewsEye International Conference
17 March 2021

DAHN Project
Alix Chagué - Floriane Chiffolleau
Research and Development Engineers at Inria



WHY A PIPELINE ?

❖ Black box:

- does everything we want; but no interception of the data, no customization;



❖ Scattered toolbox:

- risk of obsolescence and discontinuity; portability of data not guaranteed;



❖ Pipeline:

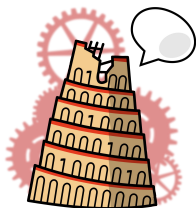
- clear steps, compatible softwares, extensive documentation
- data integrity, user in control



THE DAHN PROJECT

“Dispositif de soutien à l'Archivistique et aux Humanités Numériques”

- ❖ Members: Inria + EHESS + University of Le Mans | MESRI;
- ❖ Scientific digital edition program for archival corpus;
- ❖ Goal: facilitate the digitization of data extracted from archival collections and their dissemination to the public in the form of digital documents and/or as online editions
- ❖ ALMANACH in charge of developing and/or enhancing the tools that are part of the pipeline.



Inria



**Le Mans
Université**

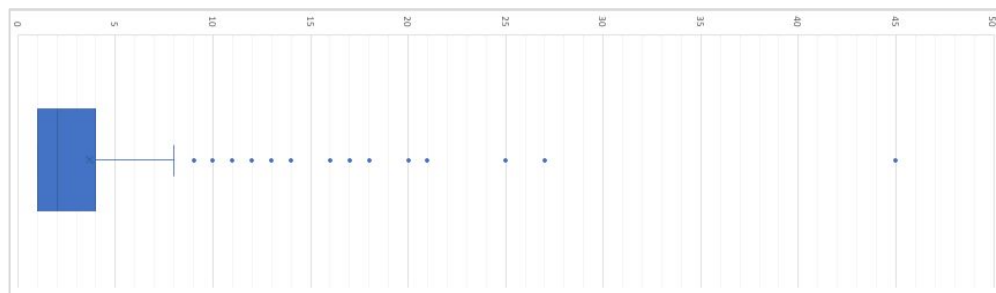


THE CORPUS: PAUL D'ESTOURNELLES DE CONSTANT CORRESPONDENCE

- ❖ The context:
 - War reports
 - Exchange of opinions between two pacifists
- ❖ The corpus, a perfect test subject:
 - Typewritten documents: easier OCR, no HTR, faster work
 - Voluminous corpus: 1500 letters, 430 from the war period alone (from April 15, 1914 to November 19, 1918), one-to-several tens pages



The sender:
Paul d'Estournelles
de Constant



Distribution of pages per letter

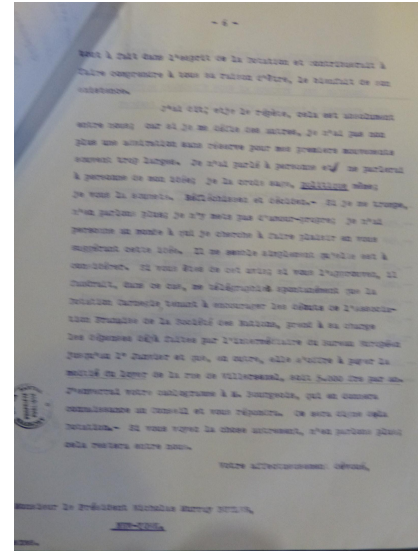
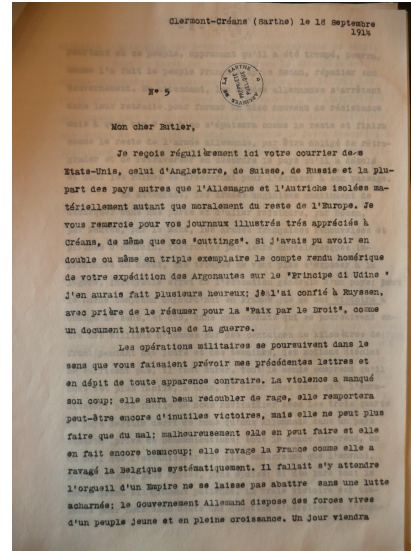


The recipient:
Nicholas Murray
Butler

THE CORPUS: DIGITIZATION OF THE CORRESPONDENCE

An heterogeneous corpus of digitizations:

- ❖ Manual photo shooting of the corpus, by a researcher of the project, prior to its creation: medium quality images, case of blurred lines, cropped images and/or incomplete pages
- ❖ Institutional and exhaustive digitization campaign with proper material by the institution where the corpus is kept: high quality images

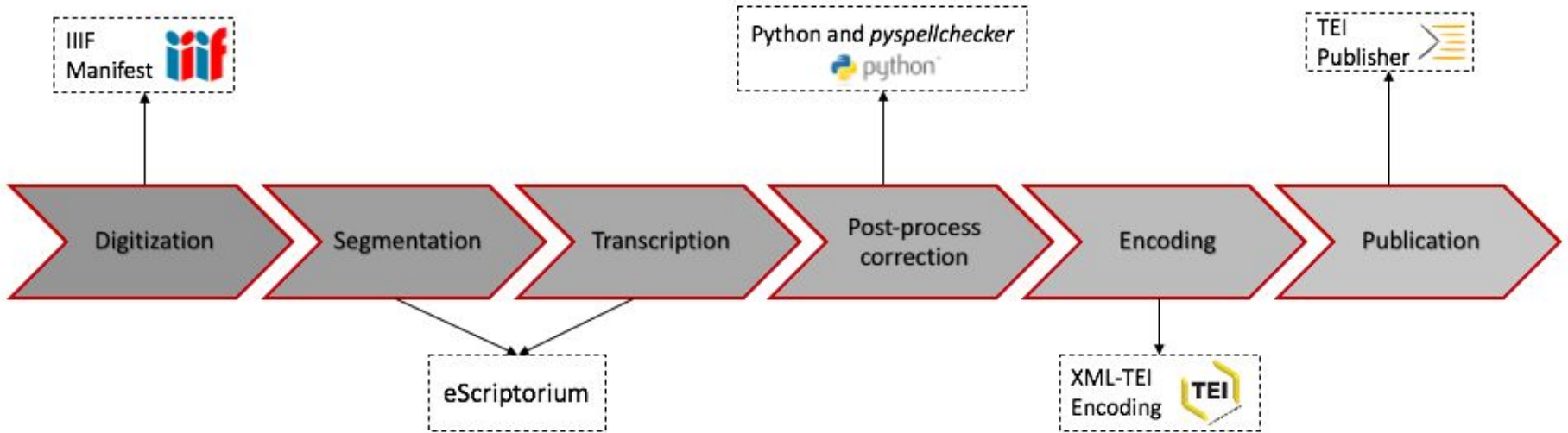


includes a few pages requiring a new digitization

only partially included in first wave of institutional digitization

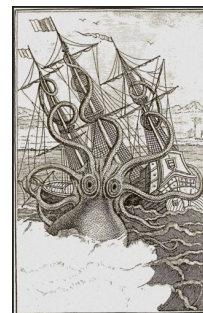
portion of the logical corpus held in another institution

THE PIPELINE

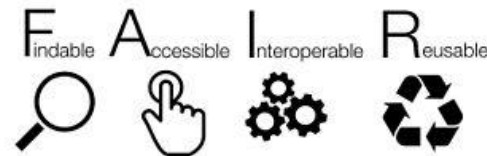


THE OCR ENGINE: A CAPSTONE

- ❖ Powered by eScriptorium and Kraken
 - eScriptorium: web interface for collaborative and automatic transcription projects;
 - Historical ties between ALMAAnCH and SCRIPTA PSL (project team behind eScriptorium);
 - Intuitive platform and user-friendly on multiple features;
 - Entirely open-source and up-to-date formats;

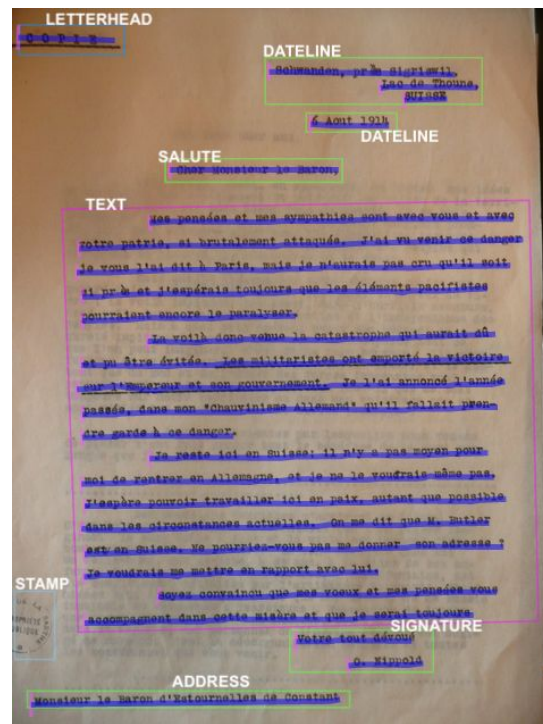


- ❖ Guiding principles:
 - Every step of the pipeline relies on open-source software or services;
 - Compliance with the FAIR principles.



THE PIPELINE STEP BY STEP: SEGMENTATION

- ❖ Segmentation and layout annotation with a system of lines and zones tagging coupled with an ontology;
- ❖ Possible to build your own modelization and pass it on to a model;
- ❖ Integration of the TEI framework early-on;
- ❖ Participation of few members of the DAHN project in [SegmOnto](https://github.com/SegmOnto), a working group aiming at creating a general TEI-based ontology for HTR projects.



Example of an image annotated for Segmonto

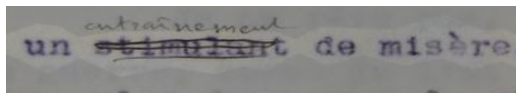
THE PIPELINE STEP BY STEP: TRANSCRIPTION

❖ Training of a transcription model

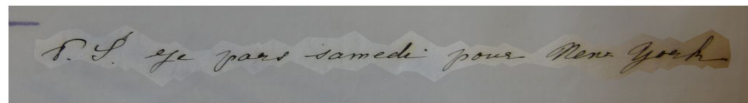
- Ground truth for the first model: 84 pages (10 letters) → not efficient enough
- Construction of a dataset more representative: focus on specific parts of text (capital letters, numbers, narrow text) - about 100 of additional pages → 92,74% accuracy
- Fine-tuning a pre-existing model (“tapuscorpus”, trained on varied typewritten docs): resulting model potentially more capable of generalization → 93,90% accuracy

❖ A model capable to render meaningful formatting of the text:

- Handwritten annotation → no recognition required, a double ‘££’ for every handwritten word
- Deletions → a ‘€’ at the start of the deletion and at the end, even if when spanning over several words



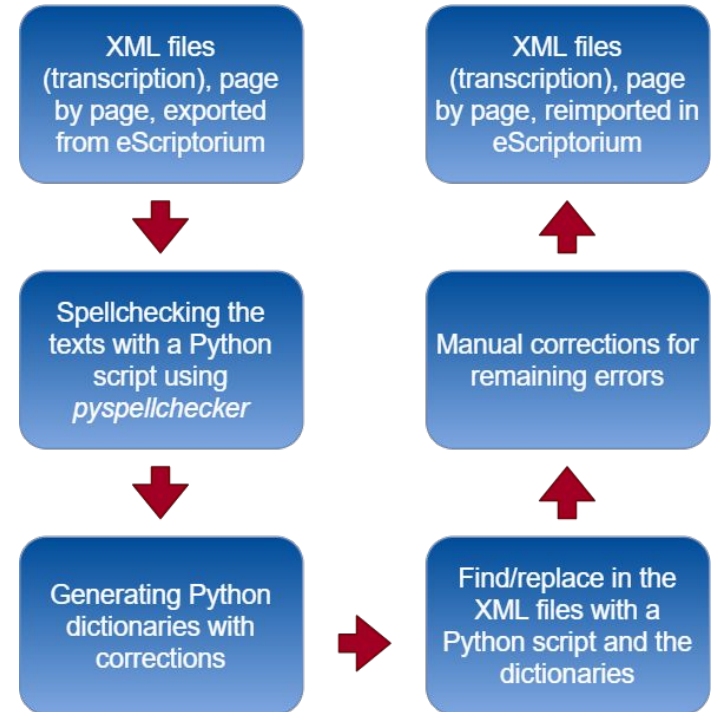
un €stimulant€ de misè



££ ££ ££ ££ ££ ££ ££

THE PIPELINE STEP BY STEP: POST-PROCESS CORRECTIONS

- ❖ Export/import with eScriptorium
- ❖ Spell-checking:
 - Python script and *pyspellchecker* module
 - Generation of Python dictionaries for correction
- ❖ Correction of texts
 - Python script and find/replace
 - Manual correction of remaining errors
- ❖ Goal → implementation of this method in the eScriptorium API



THE PIPELINE STEP BY STEP: ENCODING

❖ Header

- General encoding of the header, with manuscript description for the corpus
- Correspondence data in the <profileDesc>

❖ Body

- Default text structure (titles, paragraphs), changes in text (addition and deletion), difficulties of the corpus (unclear, gaps) and named entities (person, place, organization)
- Correspondence part:
 - Easy tags (opener, closer, address, signatures, etc.)
 - Assistance available for difficult tags: TEI mailing-list, [Correspondence Special Interest Group](#)

❖ Helping tools for the encoding

- Script for the encoding of metadata in the header, using an inventory with essential information
- Script for the encoding of the body, using regular expressions

THE PIPELINE STEP BY STEP: PUBLICATION

❖ TEI Publisher

- From exist-db, an open source software project for databases built on XML technology
- Transformation files (ODD) and templates (HTML)
- Presentation by collections

❖ Application for ego documents

- Text and image opposed
- Metadata available with a specific button
- ODD containing all the tags related to ego documents
- One corpus = one collection



Collection de corpus d'égodocuments

A screenshot of the TEI Publisher application interface. The page has a light blue header with the word "Documents". Below the header, there is a search bar with the text "rechercher..." and a magnifying glass icon. To the left of the search bar, there are navigation links: "Accueil", "Corpus", "Documentation", "Fonctions avancées", and "Langue Français". The main content area displays a list of document collections. Each collection entry consists of a small portrait image on the left, followed by the collection title and a brief description. The first entry is titled "Correspondance de d'Estournelles de Constant" and the second is "Correspondance des Intellectuels Berlinois". There is also a "SUPPRIMER" button with a trash icon.

FAVORING THE USE OF THE PIPELINE: DOCUMENTATION

- ❖ Initial documentation provided with the software, standards and framework
- ❖ Self-produced documentation
 - Comprehensive series of guidelines for the encoding of ego documents (ODD)
 - Jupyter notebooks and markdown files commenting the use of Python scripts (encoding and correction)
 - Provision of the data from the steps of the pipeline on the dedicated repository

GENERALIZATION AND MODULARITY

- ❖ Corpus of the [Berlin intellectuals](#), correspondence of the start of the 19th century
 - Modularity: Plug data in without following the pipeline from the beginning
 - Generalization: No limit of space and time for the encoding and publication
- ❖ Sustainability
 - Dissemination of the data in useful formats
 - Ground truth available in [HTR-United](#)



TO CONCLUDE: KEY TAKEAWAYS

- ❖ Scenario fully documented and based on open-source and standards to avoid blackbox and/or scattered toolbox
- ❖ Adaptability of the input and output formats of softwares
- ❖ Prerequisites to use the pipeline:
 - Digitized images
 - A transcription system such as eScriptorium/Kraken
 - A TEI modelisation of the structure of your documents
 - A server to deploy a TEI Publisher application

THANK YOU FOR YOUR ATTENTION

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LINKS

Repository of the project: <https://github.com/FloChiff/DAHNPProject>

eScriptorium: <http://traces6.paris.inria.fr/>