

A Report on the Data-Driven Investigation into "Asiatic Mode of Production"

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I Research Question and Related Work

I.1 Background with Related Work

"Mode of production" is a central terminology in Historical Materialism of Karl Marx and Friedrich Engels, which is applied to describe "historical interaction of means of production and relations of production" (Li, 2020, p. 257). In this definition, "means of production" are necessary resources for a society to carry out activities of production, which may include land, labour, capital, infrastructure and capital goods (Edmundson, 2020), while "relations of production" stand for social relations, power structures and division of labour in the organization of production (Oxford Reference, 2024).¹

In the viewpoint of Marx and Engels, different modes of production mark developmental stages or socioeconomic formations in the human history. In his *Preface to A Contribution to Critique of Political Economy*, Marx famously wrote: "In broad outline, the Asiatic, ancient, feudal and modern bourgeois modes of production may be designated as epochs marking progress in the economic development of history" (Marx, 1988). Among modes of production mentioned here, the so-called "Asiatic mode of production" (AMP) has been a concept of interest drawing many discussions and controversies, mainly out of the following 2 reasons:

- (1) The AMP concept is never systematically elaborated or completely developed in a theoretical way in works of Marx and Engels (Li, 2020; Shlapentokh, 2019). Instead, the mentioning of this concept is scattered around in their specific analyses

¹Some literature also divide human labour from "means of production", thus "means of production" only include material resources used for production in their sense. They use another collective term "forces of production" or "production forces" to include both human labour and materials used for production (e.g. in this handout). Actually, the interchange of two types of expressions can be observed within Li (2020), as in p.263: "Indeed, the mode of production is determined by the historical interaction of the productive force and the relations of production..."

over the years, leaving it open to various interpretations originated from different motivations;

- (2) The ambiguity left behind by Marx and Engels is further complicated by political struggles and rivalries in the 20th century, as this concept became an ideological battlefield. In the USSR, the PRC and other socialist countries, debates around this concept was highly subjected to political atmosphere of different periods and was suppressed by the Stalinist official "five-stage" doctrine of social development (where AMP has no place) for a long time (Fogel, 1988; Rapp, 1987; Shlapentokh, 2019). In the West, anti-communist intellectuals made use of this concept and its relation with "Oriental Despotism" discussed in Wittfogel (1957) to attack political systems of the Eastern Bloc, while "Revisionist" and left-wing scholars see the concept's modern positive value in rapid industrialization and the anti-capitalist / Euro-centric discourse in the struggle of the Third World (Shlapentokh, 2019). Entering the 21st century, institutionalized intellectuals in China are using this concept to justify a social development path different from the Western world (Tu, 2014).

As a result, the original AMP concept in Marx and Engels' works are somehow blurred by its own ambiguity and the later controversies around it. People who are interested in this concept would have to rely heavily on second-hand summaries produced in traditional qualitative methods, which are prone to subjectivity and inaccuracies caused by an incomplete collection of relevant elaborations.

1.2 Research Questions and Data-Driven Methods

Following the background illustrated in the last section, 2 possible general research questions regarding the AMP concept can be proposed:

- (1) What are original core components of AMP in primary sources of Marx and Engels?
- (2) What are temporal and regional patterns of post-Marx debates on this concept, and were there focus or connotation shifts in the concept throughout these debates?

The most intimidating obstacle of research questions above lies in the tremendous amount of time, human labours and risk of human subjectivity in the manual processing of related texts required to answer them. With this insight, it can be safely evaluated that both of them are suitable for data-driven investigations.

Firstly, well-constructed digital corpora can significantly reduce huge costs of time and human labour. With digital corpora and information retrieval technologies, it's no longer necessary to visit libraries on site, collect paper copies of related works occupying a large physical space and have a large research team to search for relevant texts exhaustively from

starts to ends, as the tasks can be fulfilled with digital text retrieval based on keywords and a much smaller group of annotators. Specifically, Betti et al. (2019) and Betti et al. (2023) introduce practical methods to establish more inclusive corpora based on the JSTOR dataset (along with its "data for research" function) and library records on WorldCat. Making use of the constructed corpora, it's possible to track the trajectory of a concept (e.g. chronological development, geographical diffusion or concept user profile) and carry out statistical analysis efficiently. In the research scenario of the AMP concept, the general research question (2) would benefit greatly from this method.

Moreover, methodological innovations in data-driven history of ideas research can uncover objective facts of a concept from massive texts in a full-scale manner and also minimize the human subjectivity in text retrieval and processing. Betti et al. (2020) provides a powerful methodology of "ground truth" construction concerning a concept from a digital corpus of complete works of an author. In this method, term-based research questions (RQs) are formed on the basis of a conceptual model established in the fashion of Betti and van den Berg (2014), then paragraphs can be retrieved based on expanded key terms of these RQs from the corpus automatically through the HitPaRank tool. Following this, a group of experts on the concept perform multi-round annotation tasks on retrieved paragraphs regarding their relevance to the RQs. The inter-rater disagreements in annotations are peer-reviewed within the group following the procedure introduced in Oortwijn et al. (2021), aiming to achieve a 100% consensus and rule out subjective biases or errors. After this, a corpus-based and expert-controlled conceptual ground truth is established. In the ideal scenario, the general research question (1) of the AMP concept can be satisfactorily answered through a similar thorough ground truth construction.

Utilizing data-driven methodologies for general research questions proposed above can help to remove limits of traditional qualitative methods for a complete concept research, verify or falsify summaries in previous works, put aside the subjective bias or political turmoils surrounding the AMP concept and restore its original form in works of Marx and Engels from an objective stand. Additionally, it's also possible to provide an inclusive descriptive retrospect of controversies and debates around the concept, which would be an interesting perspective to track the political history throughout the 20th century. However, given a limited time frame, this report will only introduce current efforts of investigation by simulating data-driven methods introduced above. It will focus mainly on the general research question (1), with the process of building an interpretive model of AMP, forming specific research questions (sub-RQs) and term lists based on this model to retrieve paragraphs for the annotation of relevance in the fashion of Betti et al. (2020). Pilot annotations of only one sub-RQ will be implemented, aiming for a verification of the AMP Ground Truth construction workflow. As for the general research question (2), I will briefly discuss experiments in setting up a demo folia-based corpus of post-Marx discussions, while reserving the actual investigation for a future endeavor.

2 Corpus

2.1 The corpus for General Research Question (1)

As mentioned in 1.1, the AMP concept was not systematically theorized by Marx and Engels and was scattered over specific analyses in different articles over years. Additionally, detailed components of this concept may have gone through transformations or enrichment over the course, as discussed in Li (2020). Therefore, to track the concept in primary sources sufficiently, the ideal corpus would be complete collected works of Marx and Engels. Luckily, the Concepts in Motions research group at the University of Amsterdam (UvA) has already constructed a tokenized digital corpus of the English-version *Collected Works of Karl Marx and Friedrich Engels*. The corpus is available on AutoSearch, and the bibliographical information is retrieved with Python codes revised on the basis of Ossenkoppele (2024b).²

2.2 The demo corpus for General Research Question (2)

In order to track international discussions around the AMP concept after Marx and Engels, the most ideal corpus would include all books, journal articles, dissertations and reports with "Asiatic mode of production" in their titles, subjects, abstracts or captions (i.e. with AMP as its theme or a sub-theme) after 1895 of all languages. However, for the practicality at the current stage, it's more wise to confine our scope to works in English or at least translated into English. Inspired by Betti et al. (2019), I first tried to utilize Constellate dataset builder provided by JSTOR "data for research" to retrieve all texts satisfying the criteria mentioned above using the following advanced search syntax:

```
ti:("asiatic mode of production") OR  
ab:("asiatic mode of production") OR  
ca:("asiatic mode of production")
```

After choosing English language, specifying years as 1895-2024 and ticking full-text availability, there was only 1 result.³ Thus I turned to an alternative manual searching strategy. With the same collecting criteria, I split the search into 2 parts. For books, with insights from Betti et al. (2023), I made use of library records on UvA WorldCat service retrieved by the following search syntax, along with filtering options of years and language:

```
ti="asiatic mode of production" OR  
su="asiatic mode of production"
```

The search yielded 125 results, after a further manual cleansing of duplication and non-English materials, a bibliography of 94 books was composed. Then the major difficulty

²Unfortunately, the more detailed author-based bibliography for Marx and Engels is no longer available on Past Masters Authors due to copyright reasons.

³A fuzzy keyword search of "asiatic mode of production" restricted to English and full-text availability was also carried out and yielded more than 100 results. I composed a Python script to extract them to individual TXT files and found that their overall relevance to the AMP concept is poor.

in making use of this list is the limited accessibility of full-text PDF files for books in it. An experimental search with all methods on the internet took a significant amount of time and harvested 26 PDF files(Zotero,bib), which is only 27.7% of all the results. PDF files with no text layers were OCRed through ABBYY FineReader PDF. It is clear that a more effective and copyright-proof method is needed for the complete collection.

As for journal articles, I made use of the "Advanced Search" function of JSTOR. The search constraints I set is in the following screenshot:

TERM(S) FIELD

"asiatic mode of production" Item Title

BOOLEAN TERM(S) FIELD

OR "asiatic mode of product" Abstract

BOOLEAN TERM(S) FIELD

OR "asiatic mode of product" Caption

+ Add row

SELECT AN ACCESS TYPE

Content I can access

Submit Advanced Search

Narrow Results

ITEM TYPE

☒ Articles ☒ Research Reports

☐ Reviews ☐ Miscellaneous

☐ Books

LANGUAGE

English

PUBLICATION DATE

FROM TO

1895 2024

(yyyy or yyyy/mm or yyyy/mm/dd)

Figure 1: JSTOR advanced search constraints

This search obtained 25 results, with bibliography available.

The current demo corpus is based on 12 of 25 (48%) PDF files (Zotero,bib) acquired from the manual JSTOR article search. The key task in its construction is extracting full texts from PDF files and exporting them into structured machine-readable TXT files. My early efforts utilized the `borb` package in Python (codes), but it ran into several processing errors in PDF decoding. Then I turned to another Python package of `pdftotext` (codes). It can run through all collected PDF files smoothly, but structural information like paragraph segmentation is messy, which would cause troubles in later tasks relying on paragraph retrieval. To resolve this, I switched to `pdfminer.six` under the guidance of Ossenkoppele (2024d). By utilizing the coordinates of text layouts from the PDF inspector in this package, one can use them as traces to locate individual paragraphs in batch, extract them with markings of separation symbols into XML files and automatically generate TXT files with proper paragraph segmentation based on XML files. However, in real practice, due to the lack of uniformity in file layouts and peculiar text layers of some PDF files⁴, I had to carry out many manual adjustments in XML files to generate satisfactory TXT files. Eventually, I managed to finish this processing for 12 PDF files within the current time frame. The generated TXT files were further tuned into the ideal UTF-8 format without Byte-Order Marks and CRLF terminators through the command line tool under the guideline of Ossenkoppele (2024e). Then they were uploaded to UCTO for tokenization and transformed into FoLiA XML format introduced by van Gompel and Reynaert (2013). Lastly, these FoLiA XML files were uploaded to AutoSearch, available as AMP-demo, a tokenized, paragraph-segmented and searchable digital corpus composed of 12 documents with 158,250 tokens.

3 Modelling

This section introduces the (interpretive) modelling the AMP concept in the fashion of Betti and van den Berg (2014), which is a vital step for the ground truth construction aiming to answer the general question (1) simulating the methodology of Betti et al. (2020), based on the corpus specified in 2.1. This modelling requires identifying the *core* of a concept in universally-quantified relational statements capturing its key characteristics. Meanwhile, the *core* of a concept contain many *margins* that are essentially sub-concepts involved. They can also be named as *determinables*, as they can be embodied in various ways by different authors. Based on a review of qualitative research in the field (Fogel, 1988; Krader, 1980; Li, 2020; Mandel, 2015; McFarlane et al., 2005; Rahman, 1979; Shlapentokh, 2019; Tökei, 1979; Zheng et al., 2022), the interpretive model of the AMP is constructed based on consensual elements, given as follows:

- (1) In any mode of production X regarded as AMP, there is no *private ownership of land* (with land as “means of production”).

⁴In some PDF files, the start of some paragraphs are visually obvious with bigger indents, but their horizontal coordinates are even smaller than the start of a plain line in the paragraph body. It’s really difficult to carry out conditional processing in this kind of scenarios.

- (2) In any mode of production *X* regarded as AMP, *self-sufficient village communities* are primary units of the society and the *natural economy* is dominant.
- (3) In any mode of production *X* regarded as AMP, the formation of the state in it is closely related to *public works* necessary for the production that individual communities cannot afford.
- (4) In any mode of production *X* regarded as AMP, the state formed in it is of a strong *despotic* nature (closely related to Oriental Despotism) and is the main extractor of *surplus values*.

In this model, (1)-(4) form the core of the AMP concept, while sub-concepts italicized in them are margins. The model will serve as the qualitative basis for the ground truth construction, with 4 specific research questions (sub-RQs) attached by lists of key terms formed in a similar method as in Betti et al. (2020):

- **RQ1:** Is the private ownership of land totally absent in the AMP?
- **RQ2:** Are self-sufficient village communities primary units and the natural economy dominant in societies of AMP?
- **RQ3:** In AMP societies, is the formation of states in them closely related to public works necessary for the production?
- **RQ4:** In AMP societies, are states formed in them always strongly despotic and extract most surplus values?

4 Data-Driven AMP Ground Truth Construction

With 4 specific research questions in place, the next key step is to curate initial term lists for each of them as anchors of paragraph retrieval, which is vital for a data-driven ground truth construction. Here I innovated the introduction of a term list o (**TL_o**) consists of 74 terms to enrich these initial lists instead of purely relying on empirical keyword analyses, which is highly restricted by the curator's lexical knowledge. The idea is to base **TL_o** on keywords related to the AMP concept itself and a list of geographical terms related to Asia (mostly in wildcard form), including historical names of Asian countries and regions in the 19th century when Marx and Engels lived, since these terms lead to contents with a higher potential to be relevant for the AMP concept. Then I searched these terms and reviewed the hit paragraphs based on the research question o (**RQ_o**):

RQ_o: Given a paragraph retrieved from **TL_o**, does it contain elaborations related to the AMP concept?

For paragraphs judged to be positive in answering **RQ_o**, I further searched for terms that might be related to **RQ1-RQ4** and dynamically added them to their corresponding

term lists for the enrichment. After a limited round of enrichment within the current time frame, initial term lists are composed following Ossenkoppele (2024a), where every term was given a rank based on their potential of relevance and extent of specificity. Additionally, terms harvested from **TL₀** enrichment are marked in red. They are listed as follows:

- **TL₁** consists of 23 terms related to discussions of ownership, with a focus on ownership of land, as land is the major means of production in pre-capitalist societies. They are primarily related to **RQ₁**.
- **TL₂** consists of 26 terms related to self-sufficient economic units in agrarian societies and descriptive expressions related to the natural economy. They are primarily related to **RQ₂**.
- **TL₃** consists of 8 terms related to public work projects and their administrations. They are primarily related to **RQ₃**.
- **TL₄** consists of 71 terms potentially related to despotism and despotic figures in political history of Asia. They are primarily related to **RQ₄**.

Following the composition of initial lists above, next steps are to expand initial lists (i.e. obtaining actual N-grams appear in the corpus based on wildcard terms) through HitPaRank mode E and retrieve paragraphs based on expanded lists through HitPaRank mode A, following the guideline provided in Ossenkoppele (2024f). Due to issues in setting up environments for HitPaRank by command line on my Windows system, I followed Ossenkoppele (2024c) to set up HitPyRank, the Pythonified version of HitPaRank, as an alternative solution. However, since I'm not with the accessibility to FoLiA XML files of the corpus specified in 2.1, Dr. Martin Reynaert from Concepts in Motion group assisted me with this step and sent me the result files (expanded list and retrieved paragraphs).

With HitPaRank-expanded term lists, one can still further curate them by excluding actual N-grams obtained from corpus that are not relevant for target RQs and filter the retrieved paragraphs accordingly. This can be achieved through another round of HitPaRank processing, but since I'm not with the FoLiA XML files, I decided to blend this step into the preparation of a spreadsheet for paragraph annotations. In the ideal scenario, annotations are to be carried out for all paragraphs retrieved for 4 RQs aiming at the complete ground truth construction for AMP. But within the current time limit, I will only carry out a pilot annotation for **RQ₃**.

In order to carry out this pilot annotation, we first need an annotation guideline. For all of **RQ₁-RQ₄**, a generally applicable guideline consists of 3 scoring options for relevance annotation has been set up inspired by the guideline for a RQ concerning the nature of Quine's naturalistic epistemology introduced in Oortwijn et al. (2021):

1: the paragraph contains strong evidence for some answer to the RQ.

0: the paragraph contains mild clues for some answer to the RQ, but they are logically weaker than those scored 1 or the annotator is not sure whether it contains sufficient evidence for an answer.

−1: the paragraph does not contain enough evidence to answer the RQ.

An experimental annotation practiced by 2 annotators independently on the same sample of paragraphs for **RQ1-RQ3** was carried out and reached a 77.8% agreement (7/9). For 2 sample paragraphs specifically for **RQ3**, a 100% agreement was reached⁵.

With this guideline in place, the pilot annotation for **RQ3** can be implemented. I imported `MARXENGELS_PM.Paragraphs.tsv` from the result files into the Google sheet, setting separator type as "tab". Based on "Contents of Output List A : Extracted paragraphs" provided in the HitPaRank documentation, I carried out the following pre-processing steps:

- (1) I created a filter for the `LABEL:UYyb1sXZ` column to filter out the ones with U list marked as "N", as U list corresponds to **TL3**. With this I kept all paragraphs with hits of terms included in **TL3** i.e. potentially related to **RQ3**.
- (2) I created another filter for the `Unique_Hits_U` column and filter out actual n-grams that are not relevant for **RQ3**: "public firework", "public gaswork", "public workhouse", "public workshop", "republican work", "work publicly" and "working-class public".
- (3) In the filter for `Unique_Hits_U`, I did a further selection to keep only paragraphs with at least one hit of an n-gram stemmed from rank-3 term in **TL3**⁶. This is to maintain a manageable workload for the pilot annotation.
- (4) I hid columns that are not of reference value for the current annotation task to reduce visual distractions.
- (5) I added 2 columns of `annotation_score` and `remarks` (holding a brief explanation for the annotation score) to record results of the pilot annotation.

These steps led to 233 paragraphs for annotation, out of 743 paragraphs containing at least 1 relevant n-gram stemmed from **TL3**. I then carried out the pilot annotation as the only annotator, scoring 8 paragraphs "1", 7 paragraphs "0" and 218 paragraphs "−1". Annotated paragraphs were then pasted to another sheet named as "Annotation Results", sorted based on `annotation_score` and presented as the final result. The 15

⁵Please refer to this spreadsheet for details.

⁶I noticed that in the `SummaryUnique_Hits_U` column, the ranking label before the colon are not aligned with the rank I defined in **TL3**. I'm not sure if there was a bug.

paragraphs scored more than -1 can be regarded as a partial ground truth of the AMP concept from the perspective of **RQ3**.

For the better visual clarity, I'm presenting a flowchart⁷ for the ideal complete workflow for the data-driven AMP Ground Truth construction proposed in this section:

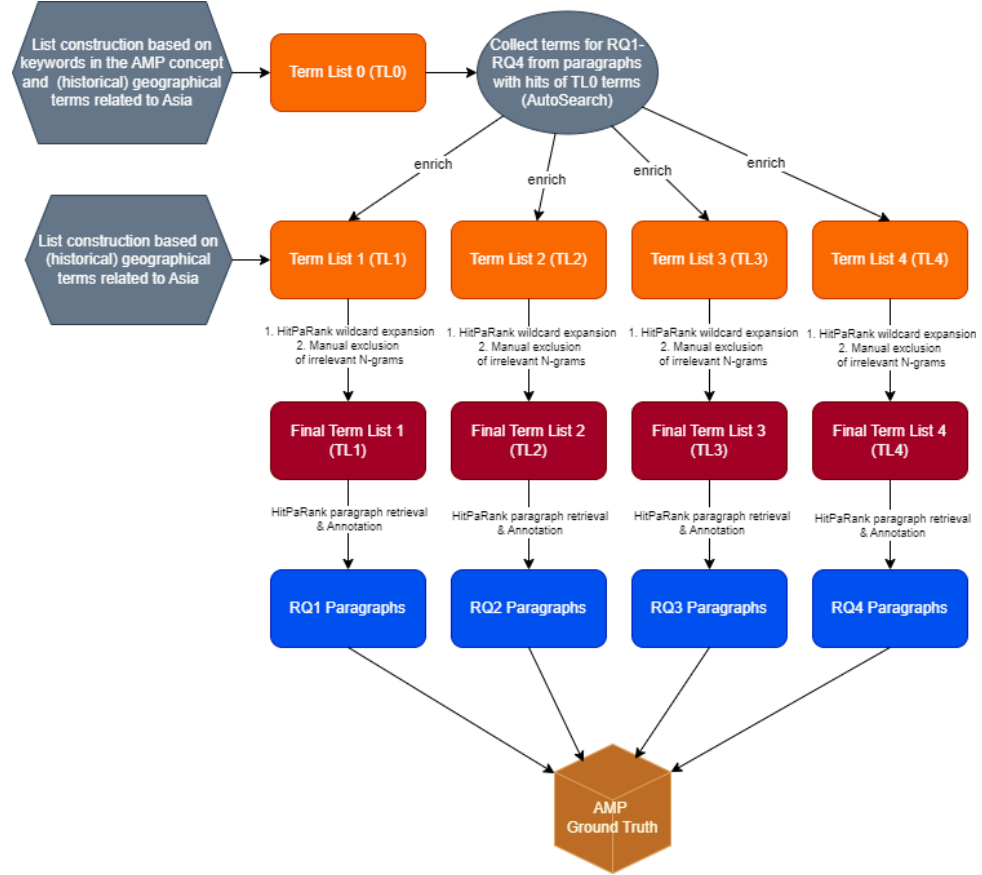


Figure 2: The complete workflow for the data-driven AMP Ground Truth construction

⁷Here is the link of the flowchart as a file.

5 Evaluation and Further Work

Currently, most efforts have been devoted to the General Research Question (1) focusing on the AMP concept in primary sources, aiming to build an "AMP Ground Truth" based on a corpus of complete collected works of Marx and Engels. An ideal complete workflow to achieve this goal was established, although only a very limited portion of work within it has been done by the author alone as a pilot research to verify its feasibility. The conceptual model set up for AMP and corresponding specific research questions (RQs) are relatively complete and satisfactory, but the curation of term lists for these RQs (**TL1-TL4**) is still limited within the restricted time frame. Firstly, although an innovative method of list enrichment based on a **TLo** was proposed, the composition of this **TLo** was so far biased to the geographical aspect (i.e. related to "Asiatic"), while potential contributions from elements of "mode of production" are not yet considered; secondly, the enrichment based on TLo already carried out is far from complete. As a result, the pilot annotation based on current **TLs** is an experiment on a small scale of "toy data". In the future, if the composition of **TLo** and curation/enrichment of **TL1-TL4** can be implemented in a full scale by a group of experts, the quality of paragraph retrieval is expected to be improved significantly. Additionally, the full-scale annotation task leading to a complete AMP ground truth would also be more reliable if carried out by an expert group equipped with a disagreement resolution mechanism.

Regarding the General Research Question 2, current efforts remained at an initial experiment of corpus construction. The most urgent future work is to further evaluate the ideal bibliography for its research and overcome barriers in the full text accessibility with the assistance from professional librarians.

words: 3954

A Appendix I

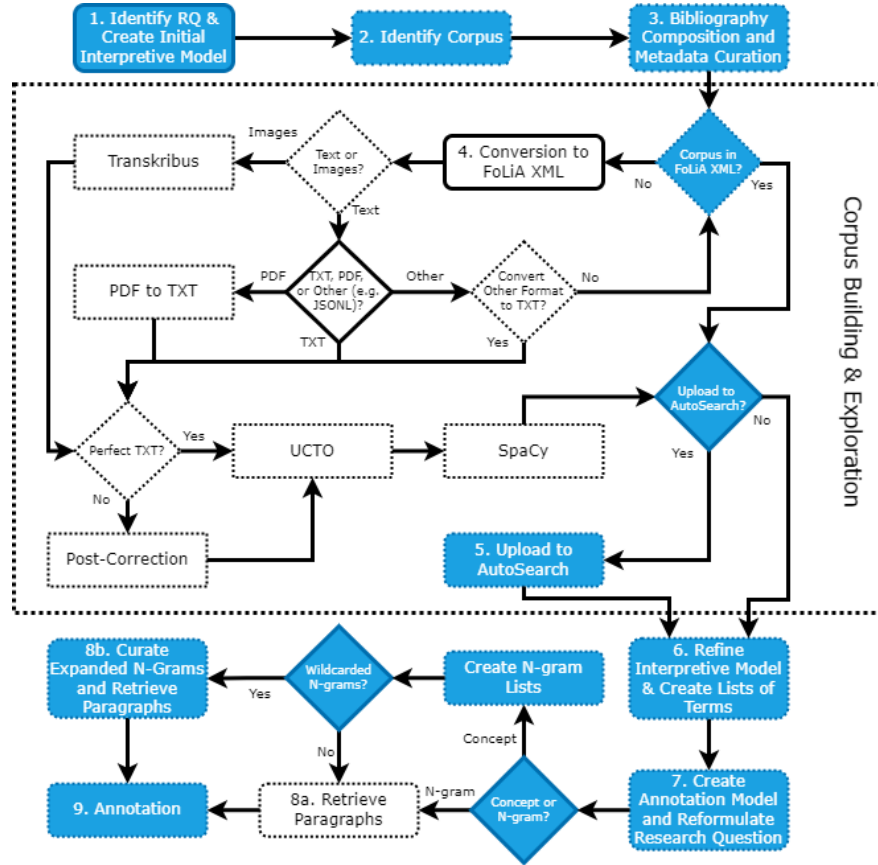


Figure 3: The actual workflow for General RQ (i) of the AMP concept. Nodes filled in blue are steps actually taken in this report. The overall workflow is complete.

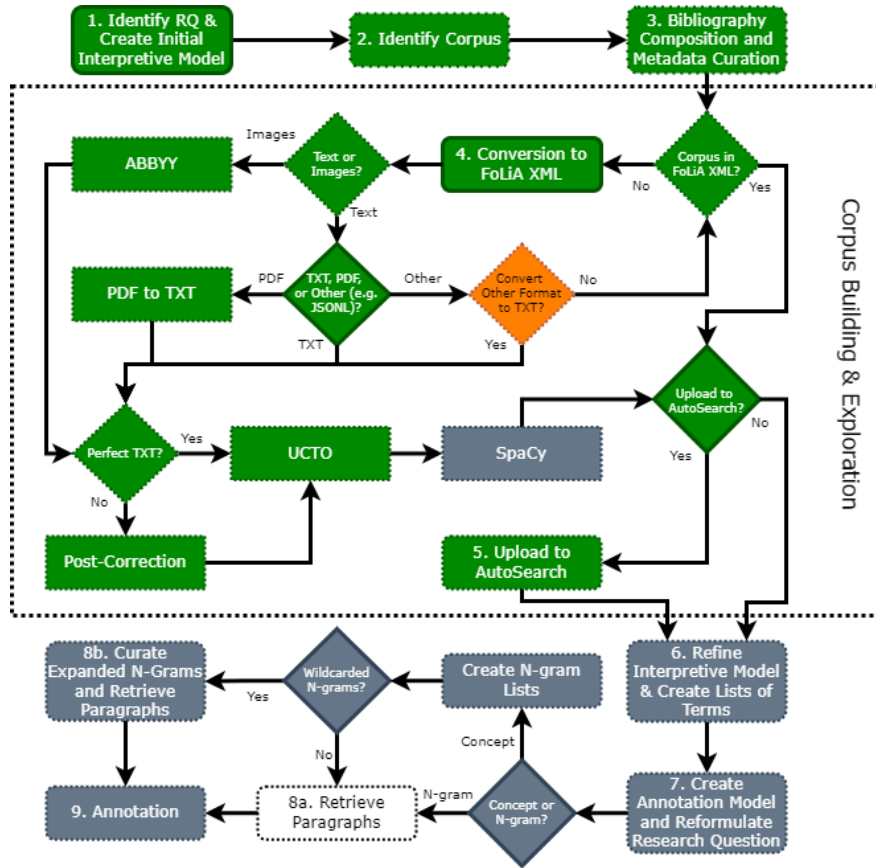


Figure 4: The actual workflow for General RQ (2) of the AMP concept. Nodes filled in green are steps actually taken in this report; nodes filled in grey are parts of the ideal workflow but left for the future due to the time limit; the node filled in orange is the step taken but abandoned due to the unsatisfactory result.

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