Abstract— Can archival science and diplomacy enhance our ability to authenticate YouTube citizen journalism videos captured in conflict-affected regions? This research explores the possibility of expanding the current process of human rights open-source investigators in verifying online videos by integrating authentication measures of archival diplomacy into the workflow of open-source investigators.

Keywords—archival diplomacy, authenticity, archival authentication, citizen journalism videos, online YouTube videos, open-source intelligence (OSINT), human rights open-source investigations, investigative journalism, human rights violations.

I. INTRODUCTION

In the next minute, five thousand hours of video content will be uploaded to YouTube [1]. Among these videos are eyewitnesses and citizen journalism videos captured in conflict-affected regions. A Citizen journalist (CJ) in this research refers to a person who is not professionally trained in journalism and who happens to document an event of socio-political significance [2]. These individuals are using video-sharing platforms (such as YouTube and Telegram) to capture attacks on civilians, civil institutions, or human rights violations. They send or upload their videos in hopes of holding the violator accountable while believing in the potential evidentiary value embedded in this record [3].

In some cases, a citizen journalism video (CJV) can be the only proof that an attack or violation took place [4]. As a piece of information, evidence, or a news piece, it is important to know if it is authentic or not. This authentication requires examining whether the video is what its publisher claims it to be and whether it is free from tampering or corruption [5].

The task of verifying CJVs is mainly assigned to human rights open-source investigators (OSI); they are individuals specialized in investigating human rights violations by collecting information from publicly available sources, such as Google maps and social media posts [6]. The verification process of citizen journalism videos (CJVs) began as an ad-hoc process to respond to the emergent need to verify a sheer number of user-generated videos. And the process has evolved into the process that we know today. It is now widely used by open-source investigators in human rights organizations, grassroots communities, and social media intelligence agencies [7], [8].

The current video verification process of OSI focuses primarily on four steps: verifying the date, the location, the source, and the original version of the CJV. Considering the absence of physical evidence and witness testimony, OSI heavily rely on open-source data1 and tools to corroborate information related to CJVs. Politt [9], in his presentation of the history and evolution of digital forensics, noted the issue of the need for tool-independent methodologies [10], [11]. When it comes to the verification process of CJVs, the challenge that Politt documented is also present in open-source investigations: there is an obvious pairing between the verification step and the tools or platforms available to carry out this step.

This research does not underestimate the ad-hoc nature of the process and the focus of practitioners on pairing their process with the tools and platforms available. Rather, it sees a natural evolution in moving beyond this approach and expanding the process of inferring CJVs’ authenticity by developing a video authentication process that is independent of tools and platforms yet can still be supported by them.

The process followed by OSI to verify CJVs reveals a conceptualization of authenticity that is different from the one of archival diplomacy. The process of open-source investigations (OSINT) focuses on assessing the truthfulness of the content depicted in a video, while archival diplomacy2 focuses more broadly on the physical and intellectual form of the video (rather than its content), the contexts surrounding the creation and use of the video, identifying the characteristics of the video that makes it a record (i.e. an archival document), identifying any changes that occurred to the previously mentioned elements, and to which extent these changes altered the content and message of the video. This different conceptualization of authenticity brings to attention the need to move beyond OSI’s conceptualization by examining the potential value of incorporating the view of a disciplinary

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1 Data that is available to the public such as online maps and social media accounts.
2 Archival diplomacy is the field that integrates concepts of traditional diplomacy with archival knowledge and applies them to examine the authenticity of a variety of digital objects in different digital environments (Rogers, 2015, p.179).
body of knowledge concerned with the authenticity of records for centuries, namely archival science and diplomatics. Diplomats was developed to examine the authenticity of various documents over centuries with scientific diligence [12]. Archival diplomats offers a conceptual framework for and means of understanding records' authenticity that can add to the practical efforts to authenticate CJVs. 3

The research in Light of Computational Archival Science

Computational Archival Science (CAS) is the “interdisciplinary field concerned with the application of computational methods and resources to large-scale records” [13]. CAS combines the knowledge of archival and computational thinking in order to understand challenges and opportunities that evolve from “the ways that new technologies change the generation, use, storage and preservation of records” and “the implications of these changes for archival functions and the societal and organizational use and preservation of authentic digital records” [13]. This paper examines the ways that video-sharing platforms, namely YouTube, change the authentication processes of citizen journalism videos that are published every single minute. The paper reports on the work in progress of doctoral research that aims at designing an authentication process for online videos captured in conflict-affected regions by incorporating the authenticity measures of archival diplomats into the process of open-source investigators.

Overview of the Research

The questions that this research attempts to answer are:

1. What are the procedures required to infer the authenticity of CJVs from the perspective of archival diplomats?
2. How can the procedures necessary to infer the authenticity of CJVs from the field of archival diplomats be operationalized into the design of a process for inferring the authenticity of these videos?
3. What are the opportunities and challenges that open-source investigators will perceive in this video authentication process?

The research explores the value of expanding current approaches to verifying CJVs by incorporating the concepts and methodology of archival diplomats. The uniqueness of this approach lies in providing a different range of considerations based on archival diplomats authentication practices for the analysis of CJVs and, ultimately, expanding the current verification process of open-source investigators. The designed authentication process was presented to OSINT to explore the opportunities and challenges associated with it. This presentation took place during online individual interviews with open-source investigators

Research Gaps

The efforts undertaken by open-source investigators to verify CJVs, which draw upon journalistic and human rights investigative techniques, remain unfamiliar with the theories and principles of a more ancient discipline specifically designed to authenticate documents, that is, archival science and diplomats.

Existing literature in archival diplomats does not examine in what ways, if at all, citizen journalism videos (CJVs) might be regarded as records according to archival diplomats, i.e., in what ways they may be considered archival documents, being “made or received in the course of practical activity and set aside for future action or reference” [14]. Neither does it examine the application of archival diplomats’ authenticity requirements to assess the authenticity of CJVs. It, however, discusses the way in which contemporary archival diplomats may infer the authenticity of digital records on the basis of their characteristics [15]. This research applied the latter knowledge to frame, analyze, and reflect on how archival diplomats can be employed to assess CJVs’ authenticity by identifying (1) how the characteristics of records are manifested in CJVs? And (2) what are the constituents of authenticity (namely the integrity and identity) are manifested in the context of CJVs?

II. CHALLENGES RELATED TO VERIFYING CITIZEN JOURNALISM VIDEOS (CJVS)

The Current Process of Verifying CJVs

Open-source investigators (OSIs) verify videos following a process that consists of four pillars: verifying the date (D), the location (L) of the event portrayed in the video, the source of the video (S), and what they refer to as the original version of the video (O) which is the first instance of the video published [16]–[19]. For simplification, the acronym DLSO will be used to refer to these four elements. Practitioners attempt to verify or infer the DLSO from the visual, audio, and descriptive metadata layers of the video by searching across a wide range of open-source data.

Inferring the authenticity of CJVs can be a challenging process at times because of the videos’ unique characteristics [20], [21]. The inter-connected challenges related to inferring the authenticity of citizen journalists’ videos (CJVs) can be grouped into issues related to

1) The de-contextualization of CJVs. A lack of contextual information related to CJVs derives from their being detached from the original circumstances of their creation. This de-contextualization makes them subject to being scraped from their original context and posted in new, irrelevant contexts [22], [23], [21].

2) The loss of CJVs metadata. Useful metadata is erased from the CJV once it is published on social networks or video-sharing websites [24]–[26].

3) The quantity and qualities of CJVs. CJVs exist in enormous quantities, and this makes it difficult to find and verify them [16]. Different aspects shape CJVs’ quality, such as aesthetic and resolution problems. Aesthetic problems of CJVs arise from the fact that they are captured by individuals who have varying degrees of video-recording skills, and sometimes none. Technical problems stem from the several encodings that CJVs undergo when uploaded online, and this renders them of low quality at times.

E.g., those of Human rights open-source investigations.
III. PROCEDURES REQUIRED TO ASSESS THE AUTHENTICITY OF A CJV FROM THE PERSPECTIVE OF ARCHIVAL DIPLOMATICS

Understanding the measures required by archival diplomacy to infer the authenticity of a CJV necessitates examining two sub-questions: first, how the characteristics of records—in archival diplomacy—are manifested in a CJV. This is achieved in this research by conducting a diplomatic analysis. Second, what attests to the authenticity of a CJV? In other words, what constitutes the integrity and identity of a CJV? This is achieved by analyzing in which ways the elements of a record’s identity and integrity are manifested in CJVs.

A. The Diplomatic Analysis and the Characteristics of Records

The diplomatic analysis is a method that describes “the formal elements of the records and their processes of creation” to help “identify the pertinent contextual information that needs to be preserved” [15]. A record in archival diplomacy is defined as “a document made or received in the course of a practical activity as an instrument or a by-product of such activity, and set aside for action or reference. Syn.: archival document.” [14]. The diplomatic analysis serves to identify: under what conditions might CJVs become or be considered as records, and which conditions disqualify them from being records? The goal is to understand to what extent CJVs fulfill the functions of an archival document (i.e. a record) that is an element of a CJV? This is achieved by analyzing in which ways the elements of a record’s identity and integrity are manifested in CJVs.

A digital entity must possess these five characteristics to be considered a record according to archival diplomacy [27]:

- A fixed form and stable content.
- An action that the record supports or participates in.
- Identification of persons involved in the creation of the record (i.e., writer, author, creator, addressee, and originator).
- An archival bond (i.e., an explicit relationship to other records outside or inside the digital system).
- Five contexts of creation (i.e., juridical-administrative context, provenancial context, procedural context, documentary context, and technological context).

To examine these characteristics, it is better to break them down into their parts.

1) A fixed form and stable content.

A fixed (documentary) form is one where the external and internal elements of a CJV do not change. The external elements of a video include the visual and audio components, the video’s frame rate and audio sample rate, the video’s date and location that was captured by the device, and special signs (e.g., watermarks, logos, hyperlinks), [15, p. 689], [28]. The internal elements, on the other hand, are the ones that constitute the internal composition of a record and convey the action in which the record participates and its immediate context [29]. This includes the description of the event portrayed in the video, the date, the location, and the name of the writer, author, and/or originator of the video [30, p. 17], [31], [32]. The extrinsic elements of a CJV remain fixed and unaltered when published online on YouTube. However, the platform recently introduced the YouTube Studio tool that allows channel owners to edit the visual and audio layers of the video after it has been published (i.e., post-publishing). This means that YouTube allows the alteration of the external appearance of published videos, which negatively impacts the fixity of the video’s form.

Content is the message a digital entity attempts to convey. It is “[t]he intellectual substance of a document—the text, data, symbols, numerals, images, sound and vision” [33]. A CJV with stable content is one with an unchanged and unchangeable message. Theoretically, a CJV content is finalized at the moment of publishing it to YouTube, but this is not always the case. The YouTube Studio lets users edit (e.g., trim) their videos after they have published them. If a video has fewer than 100,000 views, the person who published the video (i.e., the channel owner) can edit it without any change in the address i.e., the URL remains the same although the video is not the same [34]. This means that the video’s message might be altered without any indication from YouTube to the audience, consequently, it no longer has stable content. Hence, a YouTube video can be said to have stable content only from the moment it reaches 100,000 views.

2) Action.

The second characteristic that CJV must fulfill to be a record is that it must participating in an action. An action is defined as “[t]he conscious exercise of will by a person aimed to create, maintain, modify or extinguish situations” [35]. The aim behind the action of publishing a video recording of a socio-political event depends on the intentions of the person who published the video (i.e., the author)4; it might be to change or contribute to the public’s perception of an event to change, maintain, or extinguish a situation [37]. The record’s action echoes two critical concepts in archival diplomacy: the nature (or type) of the video record (whether it is a legal or nonlegal record) and the video’s status of transmission (whether it is the original, a draft, or a copy).

It is essential to examine the relation between the video (i.e., the record) and the action that the video participates in to understand the nature of the video under examination. Legal records are ones whose creation is required by the juridical or administrative system in which they exist. Legal records serve as evidence of the action they document. Examples of such records are birth certificates, land registries, and money orders. Nonlegal records are not required by the juridical or administrative system in which they exist. They are divided into supportive and narrative records. The function of supportive records is to guide an activity. Examples of this type include maps or setup instructions for a camera. The function of a narrative record is to convey information. Examples of this type include reports or accounts of events. A

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4 The author is defined in archival diplomacy as a “physical or juridical person having the authority and capacity to issue the record or in whose name or by whose command the record has been issued.” [36].
nonlegal record participates in an action but cannot provide evidence of an action by itself [38]. A CJV is a narrative record that conveys information about an event. It participates in an action, but it does not provide evidence of an event by itself. Further verification and authentication of the event and the video are required to establish the evidentiary value of a CJV.

*States of transmission* is the degree of perfection of a record, whether it is an original, a copy, or a draft [39] (“Status of transmission”, 2012). An *original* is “a perfect document and the first to be issued in that particular form by its creator” [40, p. 19]. A *draft* is a “rough or preliminary form of a document, sometimes retained as evidence” [41]. A *copy* is “the result of a reproduction process” [42]. There are different types of copies. When a citizen journalist captures a raw video using their phone and intends to publish it on YouTube, the *original* video is the one stored on the citizen journalist’s phone. YouTube strips the video’s technical metadata (such as the date, location, and frame rate) once a video is uploaded online [43]. Transferring the video from one medium (the phone) to another (the web) turns the citizen journalist’s video into a *copy*.

Given that the technical metadata of the video is lost, the type of this copy is a *simple copy*, which refers to a “copy that only reproduces the content of a record” [44]. If the CJ captured a raw video that s/he intends to send to a human rights organization, the video on the CJ’s phone is the *original* video. If the technical metadata is embedded with the video, then the organization will receive an *imitative copy*, which is a copy that “reproduces, either completely or partially, the content and form of the original record” [45, p. 65]. Hence, it is important to first understand that raw video(s) (on the phones of citizen journalists) and the one(s) they upload to YouTube or send to an organization are two different videos. Second, there is a need to preserve the *original* video along with its embedded metadata to facilitate the verification and authentication process of these videos.

3) **Persons.**

The diplomatic concept of a digital record includes the involvement of five persons in its creation: the writer, author, creator, originator, and addressee. The *writer* is the person who has the capacity and authority to articulate the content of the record [46]. In videos, this would be the person who captures the video. The *author* is the person who has the capacity and authority to issue the record; in CJVs, this is the person who publishes the video online. The *creator* is the person in whose fonds the record exists. The fonds is the entire body of records that the creator accumulates by reasons of her activity [47]. The creator is the citizen journalist if they work independently, and it is the citizen journalism initiative/group if the citizen journalist works as part of an initiative/group. The *originator* is the person who owns “the address where the record has been generated (i.e., from which the record is sent or where the record is compiled and kept)” [48, p. 17]. The CJV originator is the person from whose account the video was uploaded to YouTube. The *addressee* is the person for whom the record is intended (Duranti & Preston, 2008). Citizen journalists (CJs) use their YouTube channel to reach the addressee, the public.

4) **Archival bond.**

A CJV must possess an archival bond to qualify as a record. The archival bond is the relationship that links one record to others belonging to and participating in the same activity [49]. When this citizen journalist captures a CJV, the activity intends to memorialize that event. These video documents have an archival bond with the records of the same author produced for the same purpose.

5) **Contexts.**

For a digital entity such as a CJV to be regarded as a record, it must possess an identifiable context, which is the framework within which the action in which the record participates takes place. This characteristic is difficult to define because it includes “anything outside the record that has significance for its meaning” [48, p. 18]. There are five relevant contexts considered in archival diplomatics: juridical-administrative, provenancial, procedural, documentary, and technological.

![Figure 1](https://example.com/image1.png)

**Figure 1:** A record, such as a video, in archival diplomatics exists in five contexts, according to Duranti [45]. Figure rendered by Hoda Hammouda

The *juridical-administrative context* is the legal and organizational system to which the creating body belongs [45]. A CJV’s creating body is then bound by the legal system and laws of the country where the video’s writer/author (the person who captured and published the video) resides.

The *documentary context* is the funds in which the record exists and its structure. It is a constituent of the record’s documentary form, as demonstrated in (Figure 2). CJVs exist in the fonds of the citizen journalist (i.e., creator). The fonds is partially constituted of the videos on the citizen journalist’s YouTube channel. The CJ accumulated these videos due to practicing citizen journalism activities.

![Figure 2](https://example.com/image2.png)

**Figure 2:** The documentary context is observed in the fonds and its internal structure, and the documentary form

The *provenancial context* refers to the “records creating body, its mandate, structure and functions” [45, p. 18]. Since the creating body for CJVs uploaded to YouTube is the citizen journalist (i.e., the channel owner), the provenancial context refers to the structure and functions of her life’s public and private documentation of her actions and the way she uses her channel(s) for her purposes.

Technological context is “[t]he characteristics of the technical components of the electronic system in which the record is..."
created” [28, p. 6]. When a CJ uploads a video, YouTube servers encode it. The encoding process causes the loss of technical metadata automatically embedded in the original video by the recording device, such as the original resolution, frame rate, and the type of the capturing device, in addition to the video’s date and time.

To conclude there are four ideal conditions under which a CJV can become an archival document: when it is proven not to have been edited after publication, meaning YouTube Studio tools such as the “trim” and “add cards” were not used; when the video reaches 100,001 views; when its technical metadata has been preserved, particularly those related to time, date, and location; and when there is a more explicit manifestation of the archival bond between CJVs of the same creator that belongs to the same activity. This would help CJVs be classified as an archival document.

A CJV posted to YouTube is, in fact, a record, even though the diplomatic analysis points to aspects that hinder qualifying it as a record. The interpretations of a record, according to Duranti and Thibodeau [30], is “whatever the creator treats as its record, but that ‘whatever’ must be something that the creator can, in fact keep, associated with other records, and subsequently recall” [30]. This interpretation is affirmed by the fact that the citizen journalist intends to create a record of an event, to memorialize and capture what can be used as evidence of this event [37]. Consequently, CJVs are records even if they lack some of the characteristics of records according to the formalisms of archival diplomatics.

The diplomatic analysis method contributed to pointing in a structured manner to the characteristics of records and the way these characteristics are manifested in CJVs.

B. The Authenticity of CJVs: their Identity and Integrity

The second research area (related to the measures required to assess the authenticity of a CJV) examines the constituents of authenticity, namely the concepts of identity and integrity of records and the way they are manifested in a CJV. This required reviewing the literature on the authenticity of records [50]–[56]; the adaptation of diplomatics to digital materials [51], [55], [57], [58]; the characteristics of digital records [27], [55], [56], [59]–[61]; digital records forensics [51], [62], [63]; and the authentication (i.e., identity and integrity) of digital photo records from an archival diplomatics perspective, which was studied by Bushey [64]–[67].

"An authentic record is one that preserves the same identity it had when first generated and can be presumed or proven to have maintained its integrity over time” [68, p. 2]. Evaluating the integrity and identity of a record contributes to assessing its authenticity, which is defined as the quality of a record that it is what it purports to be and has not been altered or corrupted [5], whether intentionally or unintentionally.

Identity refers to the attributes that uniquely distinguish one record from other records [69]. It is assessed based on the formal elements of a record and/or its attributes. This includes the persons who participated in the record’s creation, the record’s date and time [70, p. 74]; the action it participated in; and its archival bond. These same aspects could be studied to explain and demonstrate the identity of a CJV from the perspective of archival diplomatics [71, p. 3092]. To understand the identity of a CJV, it is necessary to know the date of the record, the persons involved in creating a CJV, especially the addressee, the action it participates in, and its archival bond. (The aspects that constitute the identity of CJVs were all presented previously in the diplomatic analysis presented in this paper. For this reason, they will not be presented again.)

The Integrity of a record refers to its wholeness and soundness, that it is complete and uncorrupted in all its essential aspects [56] and that it can “convey the message it was intended to communicate when generated” [72, p. 53]. Regarding demonstrating the integrity of records, elements such as the appearance, metadata, and contexts of the record contribute to one’s understanding of their integrity [73]. The lack of integrity in some CJV originates partially from the lack and/or inaccessibility of metadata that captures integrity metadata, such as indications of amended annotations and/or changes made to the appearance of a video (e.g., editing it after publishing); and lack of the ability to track the person(s) who acquired the video.

IV. THE DESIGN OF THE VIDEO AUTHENTICATION PROCESS

The video authentication process was formulated by the examination and findings of (1) the diplomatic analysis for CJVs which uncovered the way in which the five characteristics of a record are present or absent in a citizen journalism video, and (2) the constituents of the identity and integrity (i.e., authenticity) of CJVs from the lens of archival diplomatics.

The analysis and examination were accompanied by surveying scholarly work and case studies that describe the process of open-source investigators who verify online videos in conflict-affected regions. This was essential to understand the similarities and differences between the process and the terminology related to verifying videos in OSINT and those related to authentication videos in archival diplomatics.

The characteristics and sub-characteristics of a CJV record in addition to the constituents of its identity and integrity of were each translated into questions that the open-source investigator will research in relation to the online video s/he is verifying. Paper and digital sketching were used to prototype the process workflow. The resulting process embodies a design for an authentication process that is the first to translate archival diplomatics authenticity measures to make them applicable to the authentication of open-source video verification.

1 The date of the act and/or documentation of record.
2 Which are juridical-administrative, provenancial, procedural, documentary, and technological contexts.
3 These aspects are: the five relevant contexts, the archival bond, the action it participates in, and when and for whom was it created (date, and addressee).
4 Changes made to the video may render it incomplete as this will result in changing the message that it was intended to communicate when it was first published and consequently the record will not achieve its purpose and an unintended message will be conveyed instead.
online CJVs captured in conflict-affected regions. As open-source investigators come from a non-archival diplomatics background, the process was worded using non-disciplinary terms when referring to the different elements of the authentication process. The next presentation of the process’s elements will include, between parentheses, the terms used to describe the element in archival diplomatics.

The top-level elements of the video authentication process are:

1) The persons involved in the creation of the video—i.e., CJV (i.e., persons)
2) The purpose of the CJV (i.e., the action)
3) The relation between the CJV and other records (i.e. the archival bond)
4) The relevant contexts of creation (i.e., contexts)
5) Elements related to the form of the CJV (i.e., documentary form and context)
6) Elements related to the fixity of the form and content of the video (i.e. the video’s fixed form and stability of content)
7) Elements related to the identity of the CJV
8) Elements related to the integrity of the CJV

V. THE ELEMENTS OF THE VIDEO AUTHENTICATION PROCESS: A DETAILED VIEW

This section presents the breakdown of the top elements of the video authentication process. It consists of questions that the investigator attempts to answer to infer the authenticity of the CJV. Each of the sub-sections starts with the exact wording of the corresponding questions from the authentication process, followed by a brief explanation of or clarification for this element when necessary.

The Proposed Video Authentication Process

A. The persons involved in the creation of the video.
   • Identify the following persons—if possible:
     ○ The person(s) who captured the video.
     ○ The person(s) who published the video online.
     ○ The person who owns the channel that published the video online.
     ○ The person(s) to whom this video was sent. (For example, the public audience of YouTube.)
   • Identify—if possible—information about each of these persons other than their names or pseudo-names. (For example, their linguistic and geographic background.)
   • Who is the source of the video?

The process starts by asking open-source investigators to answer some questions related to identifying the persons involved in capturing and publishing the video.

B. The purpose of the video (known as the action in archival diplomatics):
   • Identify why this video was published.
   This element asks the investigator to think about the function of the video, that is the purpose behind publishing it online.

C. The relation between the CJV and other records
   • Identify if there are other records (such as videos, blog posts, social media posts, tweets, …) that were published for the same reason for which this video was published and by the same person(s)/organization.
   • Identify if there are tags associated with the video
   • Identify if the video is part of a playlist

This element asks the investigator to attempt to reflect on the archival bond of the video, which is the relationship that links one record (that is, the CJV) to other online records belonging to and participating in the same activity [49]. When examining the concept of archival bond in CJVs, the key concept is that these records participate in the same activity as other records (regardless of their medium). For a citizen journalist, the function of the video is to document an event, such as a protest. We can say that these videos have an archival bond with other records (such as other videos or tweets or a blog posts) of the same person who published the CJV as part of the same activity of, for example, documenting protests.

D. The relevant contexts of creation.

Juridical Context:
   • Identify if there are any laws in the region where the video was captured that impact capturing the video.
   • Identify if there are any laws in the region where the video was disseminated that impact the dissemination the video.

Procedural Context:
   • Was there any editing done before the video was published on YouTube?
   • Was there any editing done after the video was published on YouTube?
   • Does the video-sharing platform (YouTube) allow editing videos after publishing them?
     ○ If yes, does the platform indicate if editing has been made to the video after it has been published?
   • Does the platform provide a new URL for the video that is edited after it has been published?

Technological Context:
   • What is the status of Internet infrastructure in this region (e.g., Internet access, penetration rate, Internet adoption)?
• What is the availability of electronic devices that capture citizen journalism videos (CJVs) in this region?
• What is the availability of citizen journalism initiatives or training on capturing or disseminating CJVs in this region?
• Was the video captured in a region witnessing conflict between two or more parties (within the same country or between countries)?
  o If yes, name the parties.
  o Is the technological capacity of the two parties equal? (Is there a party that has a better technological capacity than the other?)

Provenancial Context:
• Is the platform hosting the video the usual platform that the publisher of the video uses to publish their videos? (E.g., does s/he usually post their videos to Twitter, or YouTube?)

E. Elements related to the form of the CJV:

Date
• Identify these dates—if possible:
  o The date of capturing the video.
  o The date of uploading the video to the video-sharing website online.
  o The date of publishing the video to the video-sharing website.

  Can the channel owner change one of these dates after the video was first published on YouTube?
  o If yes, which one(s).
  o Does the platform (YouTube) indicate if a change in one of these dates occurred?
  o Can a change in these dates (that you were able to identify) change the message of the video?

Location
• Where was the video captured?
• How did you infer the location of the video?
• Was your inference based on any of these clues?
  o The title or description of the video on YouTube.
  o The audio of the video (e.g., the subject said that this is the location).
  o The location was written on the video (e.g., the witness wrote the location on a paper and filmed it).
  o Via visual clues in the video (e.g., street name was shown in the video, or the location was verified by matching visual clues with Google maps).

  Does the video-sharing platform (YouTube) allow the channel owner to make changes (after the video was first published on YouTube) to the layers that contain info about the location? For example, can s/he change the title, description, audio, or visuals of the video?
  o If yes, does YouTube indicate that such a change occurred?

F. Elements related to the form of the CJV and its impact on the fixity of the video’s form and content

Visuals and the fixity of the video’s form
• Does the video-sharing platform (YouTube) allow the channel owner to add or remove visual elements to the video after it has been published online? Visual elements can take the form of still images, video clip(s), signs, logos, watermarks, and hyperlinks. (Removal can take the form of cropping the video’s frame, hiding subtitles or car plate numbers.)
  o If yes, does the video-sharing platform indicate an addition or removal of visual elements (post-publishing) occurred?
• Can you observe any visual elements (such as images, video clip(s), signs, logos, watermarks, and hyperlinks) that were added to or removed from the video after it has been published online?
• Can/ does this addition or removal of visuals (post-publishing) change the message of the video? (Message and content in archival diplomatics are synonyms.)

Visuals’ playback speed and the fixity of the video’s form
• Does the video-sharing platform allow the channel owner to change the playback speed of a video after the video is published?
• If yes, does the video-sharing platform indicate if a change in the playback speed of the video (post-publishing) occurred?
• Can you observer if the playback speed of the video changed after it has been published online?
• Can/ does this alteration of the playback speed (post-publishing) change the message of the video?

Audio
• Does the video-sharing platform (YouTube in this research) allow the channel owner to add or remove audio layers to the video after it has been published online? (Removal can take the form of muting parts of the video.)
• If yes, does the video-sharing platform indicate that an addition or removal of audio layers (post-publishing) occurred?
Can you observe any audio layers that were added to or removed from the video after it has been published online?

Can/ does this addition or removal of audio layers (post-publishing) change the message of the video?

**Audio’s playback speed and the fixity of the video’s form**

Does the video-sharing platform allow the channel owner to change the audio’s playback speed (i.e., sampling rate) after the video is published?

If yes, does the video-sharing platform indicate if a change in the playback speed of the audio (post-publishing) occurred?

Can you observe if the playback speed of the audio changed after it has been published online?

Can/ does this alteration of the audio’s playback speed (post-publishing) change the message of the video?

**Alterations to the video’s form due to privacy concerns**

Do you think the person who published the video changed or hid any elements (such as visuals, audio, location) for privacy concerns? (Changes in this case, can take the form of blurring faces of individuals shown in the video, or changing their voices to protect them.)

**G. Elements related to the identity of the video**

There are elements (other than the one listed in this subsection) pertaining to the identity of the CJV that were presented in the authentication process in previous elements, such as the action and the persons involved in the creation of the video and its archival bond. For this reason, the process does not repeat questions related to these elements.

- What is the visibility status of the video on the video-sharing platform (YouTube)? (E.g., Public, unlisted, or private.)
- What is the type of video’s license? (E.g., standards YouTube license or Creative Commons.)
- What is the quality of the video? (E.g., a high-definition video (HD) or a lower definition.)

**H. Elements related to the integrity of the Video**

- Identify if there are duplicates of the video that exist elsewhere.
- If duplicates were found:
  - What is the relation between the video you are investigating and the duplicate you found?
  - Which video is the first to be published online?

This concludes the presentation of the video authentication process that this research is proposing. Overall, it consists of inferring various elements related to the video and then identifying the range of alterations that the person who published the video can make after it has been published, as well as the capabilities that the video-sharing platform gives to the video publisher to make changes to the video and finally identifying whether the platform indicates that changes occurred to the video post-publishing.

**VI. CURRENT AND FUTURE TESTING OF THE AUTHENTICATION PROCESS**

Online interviews were conducted with six open-source investigators to present to them, and text, the authentication process outlined in this paper). The interviews probed the opportunities and challenges they perceive in integrating the procedures necessary to infer the authenticity of CJVs from the field of archival diplomacy into their current workflow. The interviews were semi-structured, in-depth online interviews. Their average duration was two hours and forty-five minutes with each participant. Analysis of these interviews—to examine the perceived opportunities and challenges of the proposed CJV authentication protocol—is ongoing and will be discussed in a future paper. This analysis will be followed with the second interview study will take the form of an online focus group discussion with open-source investigators. The process will be iterated based insights drawn from the individual interviews study will be used to further investigate the perceived opportunities and challenges—related to the framework—during the second interview study to gather feedback from open-source investigators.

**VII. CONCLUSION**

This paper reports on the work in progress of dissertation research which applies archival diplomacy theory to infer the authenticity of online citizen journalism videos captured in conflict-affected regions. This application was operationalized in the design of the authentication process for online videos and was presented in this paper. The goal of designing this process is to revisit and expand the current video verification workflow of open-source investigators. To achieve this, this research applied the knowledge of disciplines primarily designed to study the authenticity of human records, namely archival science and diplomacy, to infer the authenticity of a sophisticated form of online video.

**ACKNOWLEDGMENT**

I want to thank my mom, Amal Badie, and my supervisor, Dr. Lemieux for her support and guidance throughout this process. I want to thank the open-source investigators who gracefully participated in the first round of interviews. And thank you, Noraldin, for teaching me self-learning.

**REFERENCES**


