



AI-Enhanced Qualitative analysis in Media studies:

Balancing efficiency and epistemic depth

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Abstract

The aim of this research paper is to identify tools and steps of digital processing of data in media studies, which may adopt in qualitative study instead of traditional methods. While these tools can commandingly improve the ease of conducting research, important scope questions also arise. The proposal argues critically how such technologies might enrich and offend the depth of credibility and nuance interpretation of qualitative research in media studies. With such considerations, the study attempts to find a balance between efficiency provided by technology and integrity of knowledge.

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1. Introduction

The relentless progression of scientific knowledge, coupled with the pervasive integration of technology into daily life, has dramatically enhanced our capacity to generate and collect data. This evolution has catalyzed the digitalization of businesses, scientific research, and everyday services globally, making digital codes a hallmark of most products.

In addition, artificial intelligence (AI) was also used in scientific research and was considered at some point among the important technological tools in analysis.

As technology marches forward, it has introduced an array of new data types, texts, images, videos, and multi-task systems, each contributing to an exponential increase in the volume of data stored daily. This surge underscores the urgent need for innovative techniques and intelligent tools designed to transform this vast data repository into actionable information, epitomized by the development of advanced data mining tools.

In today's digital era, modern technologies have become a cornerstone of the research domain, asserting their presence robustly within the realm of informatics. These technologies have revolutionized the research process, significantly reducing manual labor and expediting analytical procedures. Contrary to the popular belief that these tools might supplant human effort, or even as tools that may create complex ethical issues. (David & Hosseini, 2024)

They are, in fact, crafted to augment the human capacity, specifically aiding researchers in enhancing the speed and

accuracy of research processes, while mitigating the subjective biases that might otherwise skew the integrity of scientific inquiry.

Despite their benefits, digital research tools, ranging from text processing and coding programs to theory-building software that seeks to elucidate the relationships between variables, have attracted considerable critique. Critics argue that an over-reliance on these tools for analyzing qualitative data may undermine the foundational manual skills of qualitative research. There is a growing concern that these tools might render research a superficial pursuit, dominated by automated procedures.

This apprehension is not confined to the disciplines of psychology and sociology but also pervades media and communication studies, a field inherently rich in media content and necessitating in-depth qualitative analysis. While digital tools have substantially accelerated the pace of analysis, they simultaneously raise alarms about the potential for digitalization to foster a shift towards generalization and mechanization in qualitative research.

This paper seeks to bring these critical issues to the forefront, stimulating a rich discourse aimed at exploring:

- How is the digital processing of qualitative data undertaken? And what are the potential epistemological impacts of these technological advancements on the field of media and communication studies?
- And how to use the artificial intelligence (AI) tools to help researchers analyzing qualitative data without falling for ethical issues?

2. Theoretical Framework

The qualitative researcher is often besieged by a variety of criticisms, ranging from the methodological approaches employed in addressing diverse phenomena to the analytical perspectives applied. These critiques also target the instruments used, and even cast aspersions on the integrity of the outcomes, citing their lack of transparency and the inherent complexity of the methods, thus undermining the researcher's competence. Detractors contend that researchers struggle to grasp and effectively engage with the qualitative paradigm in social studies. Furthermore, a segment of the academic community tends to undervalue its significance and the rigorous demands it places on the analysis of qualitative data.

In rebuttal to these critiques, qualitative research, with its inherent flexibility, provides extensive opportunities for researchers, enabling active participation throughout the research endeavour.

This participation entails documenting perceptions and furnishing insightful responses to research queries, which enhances engagement with the subjects and deepens the understanding of their psychological intricacies, nuances that quantitative research often overlooks. Unlike the detached generalizations typical of quantitative methods, qualitative research not only registers subjective opinions and attitudes but also vividly captures the varied real-world experiences and viewpoints of individuals.

However, despite its apparent simplicity, the nature of qualitative data

can reveal contradictory and ambiguous perspectives, especially challenging for novices, such as doctoral candidates participating in scientific symposia. This challenge is further accentuated by continual advancements across disciplines, propelled by modern technologies that now equip qualitative researchers with tools to swiftly process data through classification, coding, and synthesis of variable relationships.

Experts urge caution for those newly introduced to these technologies in qualitative research, as they embody assumptions that researchers must recognize. These include understanding the epistemological ramifications of technology, the so-called 'dark side' of technological advancement in research, which can promote certain analytical methodologies while sidelining others that do not conform to its database parameters.

3. Which AI tools can be used for Qualitative Data analyzing?

Qualitative data analysis is inherently a selective process. It is not governed by predetermined rules or decisions but shaped by the researcher's choices made throughout the qualitative research journey (melkkaoui, 2011). These decisions regarding the reliance on specific analytical tools are made in the midst of research activities, adapting to the evolving needs of the study.

Regardless of the opinions that may intertwine here and there about the consequences of using artificial intelligence tools in qualitative research, such as facilitating research work to the point of limiting it or fear of falling into

the trap of lack of credibility, we find that, when it comes to using artificial intelligence tools in qualitative research, there are many and variety of smart tools and platforms that researchers can rely on throughout their study, for example, it can assist researchers in data collection, transcription, coding, summarization, and even in writing results.

Artificial intelligence's transformative potential lies in its capacity to efficiently process massive datasets in qualitative research and distinguish complex relationships within the data, radically changing researchers' approaches to analyzing and interpreting data and extracting valuable insights. Artificial intelligence encompasses a variety of technologies and algorithms specifically developed to facilitate the simulation of human-like cognitive functions.

These functions encompass a range of processes, such as knowledge acquisition, logical reasoning, complex problem solving, interpreting sensory stimuli, understanding linguistic input, and selecting courses of action.(Christou, 2024)

3.1 Data collection and transcription

To convert recordings from focus groups or audio interviews to another form of data, such as written, for example, the researcher can rely on the following tools- which are great for saving time and reducing manual effort:

Trint: it supports collaborative annotation and is used by well known media firms such as BBC and Reuters. offers AI-

powered transcription that provides a quick service of converting data that contain audio and video into text. Unlike Siri or Google Talk, Trint is designed to transcribe long blocks of text.

Otter.ai: it's usually used for transcribing interviews and meetings in qualitative studies; provides real-time transcription services, converting speech into text with features like keyword extraction and even identify the speaker,

Descript: useful with interviews in qualitative researches; it can edit media by editing text, further more it helps in descript transcribes audio/video. (jarnow.2017)

3.2 Coding & Thematic Analysis:

Thematic Qualitative Analysis is an effective method for identifying, analyzing, and categorizing themes within a dataset. And it helps identify concrete themes and more subtle semantic cores within data. This approach involves a structured process whereby the researcher familiarizes himself with the data then codes and analyzes it thematically, (Turobov, Coyle, & Harding, 2024)

which leads to helps the researchers understanding of the phenomena under study. Furthermore, artificial intelligence has the potential to assist in the detection of codes, patterns, and themes within qualitative datasets, for example:

NVivo + AI Assistant (QSR International) : is known as a classic qualitative research software which now uses AI to help with auto-coding, pattern detection, and summarization.

Dovetail: focused on customer research -

auto-tagging, theme recognition, and insight visualization.

Atlas.ti (AI-Enhanced) :A qualitative analysis tool featuring auto-coding and pattern recognition capabilities.

Quirkos + AI extensions: Offers a simplified interface and the ability to suggest thematic codes via AI plugins.

CoAlcoder (experimental): Created for collaborative coding with AI suggestions for thematic codes, it is used in academic research.

Moreover, and in keeping with the new updates, two of the major software packages for qualitative analysis, ATLAS.ti and MAXQDA have partnered with with OpenAI, the developer of ChatGPT to develop their qualitative analysis methods. In return, the interaction with researchers has shifted, making coding automatic instead of the old manual approach. This has also reduced the time spent on qualitative analysis. But it is worth noting that ATLAS.ti still treats ChatGPT as a tool for coding data. (Morgan, 2023)

3.3 Text Generation & Summarization (Language Models):

for this process the researchers can rely on OpenAI's tools such as ChatGPT or GPT-4 that Can analyze, summarize (Summarizing long interview transcripts), or rephrase qualitative data, Suggesting research questions, Generating or refining coding frameworks and Drafting sections of research reports or papers.

We can say that after research conducted by researchers in the field that ChatGPT significantly reduced analysis time with moderate to good concordance

compared with current practice. This highlighted the potential adoption of ChatGPT to facilitate rapid preliminary analysis. (Adeline Kon, Pereira, & yip, 2025.pp354–358)

3.4 Sentiment & Emotion Analysis

Sentiment analysis is classified into Document level, Sentence level and the feature level, For studies involving user feedback or social media data, AI tools can extract emotional tones. Document level: All sentiment-related words in the entire document are analyzed, and without focusing on each point of view, the positive or negative outcomes of sentences are analyzed. The examination assumes that the entire document addresses a specific topic. It then assesses whether the tone of the entire report is positive or negative. This type of sentiment analysis is used in applications such as social and psychological testing through cross-correlations, customer satisfaction analyses, and patient analyses in therapeutic settings, and for this aim we can rely on Monkey-Learn as an AI tool which offers custom sentiment analysis models for text classification and keyword extraction. Furthermore Sentence level, feature level, or angle level. Similarly, at the sentence level, the goal is to detect sentence boundaries, and the result is given at the overall sentence level.

It determines whether the actual sentence is exceptional or topical. It also interprets whether the overall sentiment of the sentence is positive or negative in active sentences, which are considered micro-registers. It is widely used in tweets, Facebook posts, and SMS. and we can use in this case Lexalytics / Meaning-

Cloud Advanced NLP engines that provide emotional tone, intent, and theme detection. (Chakriswaran & Vincent, 2019)

4. Digital Processing of Qualitative Data

Sociologist Robert Dingwall emphasized in 1992 that a significant methodological misconception in historical social research was the belief that the essence of science lies in a specific set of tools. Instead, Dingwall argued that science is more fundamentally about a mindset, attitudes, or the organizational circumstances that enable these attitudes. It is these situations that necessitate particular tools, not the other way around, distinguishing the adaptive and responsive nature of qualitative research (Al quraini, 2020)

The integration of computers into the analysis of qualitative data began in the 1980s, bringing with it numerous advantages that enabled researchers to achieve both precision and swiftness in their results. This technological advancement has minimized the time spent on categorizing and coding materials, as well as on establishing relationships between variables.

Moreover, it has enhanced the flexibility with which various research operations can be performed and expanded the capacity for data storage, thus providing ample space for storing diverse data collected from the field and for monitoring different analyses of the phenomena under study. (Mohamed, 2018)

Researchers have leveraged the capabilities of computers to present data in innovative ways, signifying a noteworthy

advancement in the technological evolution of scientific research. The increasing deployment of these tools in the collection and analysis of qualitative data has led to their being considered indispensable components of qualitative research methodology. Their development and application have continued to increase in response to the needs of researchers, with continuous updates making it challenging at times to choose one program over another.

These tools are categorized under the umbrella of qualitative programs and are typically divided into subcategories such as text processing, word processing, and coding programs. These specialized tools enable researchers to define keywords or specific symbols, encode data, and facilitate the retrieval and classification of data, as well as aid in theory-building by exploring relationships between variables.

However, the evolution of these tasks into more complex programs that analyze qualitative content from various angles has not been without critique. While these programs facilitate researchers' work by saving time, reducing effort, and minimizing errors, thereby ensuring precision in results, they have also faced considerable criticism.

Some practitioners have raised concerns about the heavy reliance on these tools for analyzing results in qualitative research and the potential risks this poses to the integrity of research outcomes. Among the critics is Seidel, the creator of the Ethnograph program, who has expressed concerns about the potential for absolute reliance on these tools (Seidel & Clark, 1984), especially among novice researchers with limited experience in

qualitative research.

Seidel warns that such dependence may obscure the true spirit of qualitative research and eliminate the distinctive manual skills it requires, thus imparting a mechanical quality to the research process. He highlights the danger of falling into the trap of superficial analysis, particularly in the theory-building stages facilitated by these programs, which may promote a fixed, one-size. (Elati, 2015)

5. Steps in the Digital Processing of Qualitative Data

The digital processing of qualitative data encompasses several critical stages that are essential for researchers in the field to understand and execute meticulously. These stages are as follows:

5.1 Data Entry Stage:

This initial stage requires that researchers meticulously input the collected data into a computer following its acquisition from the field. Data collection during qualitative research may involve various tools such as interviews, focus groups, observation, among others. Once collected, it is crucial to convert this data into a format suitable for computer processing. If the data is initially captured in handwritten notes or as outcomes of interviews, the researcher must create a digital template within a computer file for input.

Printed materials can be digitized using a photocopier, and advancements in software technology now allow the conversion of handwritten text into digital text. In cases where the data includes

audio recordings from interviews or focused group discussions, transcription is essential. (Elsayed & Schneider, 2014)), It is imperative that researchers pay close attention to this first step of data entry, as it is foundational to the research process, requiring accuracy to prevent errors in subsequent analytical stages. (Alfegeh, 2018)

5.2 Storing and Organizing Text

Once data entry is completed, the next step involves the storage and organization of this data within a software system. This system should support storing all data in a unified file on a disk in a format that is compatible with the installed computer program, enhancing the ease of data access and readability.

This approach is known as the internal file perspective. Conversely, some programs may prioritize the processing of text from its original form, referred to as the external file perspective.

Despite the various methods available for storing qualitative data, simplicity often prevails as the preferred approach; thus, storing data in straightforward file formats is advisable. (Abd elati, 2015)

Following data compression for storage, the organization of the qualitative texts begins.

This phase involves a mechanized system where indexing, organizing, reviewing references, and retrieving notes and discussions related to the topics at hand take place. This data is then stored in a database program and regarded as the primary data for analysis.

The storage function plays a crucial

role as it defines the data's identity, its sources, associations, users, and the embedded ideas, setting the stage for detailed analysis and interpretation in later stages of qualitative research (Abd elati, 2015)

5.3 Qualitative Data Analysis

While qualitative researchers have traditionally engaged in manual analysis, the advent of computers has greatly enhanced these tasks, offering remarkable improvements in speed, accuracy, and objectivity. The capabilities of modern data management and processing methods exceed those of human efforts, notably in reducing the time and energy traditionally expended in analysis. To harness the full potential of technology, researchers must equip their computers with advanced text processing programs.

The proliferation of text analysis software has significantly expedited the content analysis process. Initially, there was skepticism concerning the input of raw data into computers; however, the dynamic and continual enhancements of these software solutions have bolstered confidence in their ability to accurately count recurring words and categorize content, performing these tasks with a level of precision and efficiency unattainable by human effort alone. (Abd elati, 2015)

This phase of analysis includes crucial sub-stages such as text indexing and search, coding and retrieval, and theory-building. Notable software programs tailored for these purposes include Atlas/Ti, Media Analyst software, Ethnograph, and the software formerly

known as NUD-IST, which has evolved into the NVIVO program by QSR International.

Since 2014, NVIVO has been available for both Windows and Macintosh operating systems, providing robust support for researchers analyzing data across various scales and complexities. This includes, but is not limited to, data from interviews, focus groups, surveys, social media, and journal articles. These tools offer researchers streamlined ways to organize, store, and retrieve data, enhancing efficiency and precision, and ensuring robust data backup capabilities. (libguides, 2023)

Despite the numerous benefits that computer software brings to the analysis of qualitative data, characterized by its precision, speed, and the computer's ability to methodologically address numerous questions with consistency and accuracy, there remain critical perspectives, especially among novices in qualitative research or those new to using these software tools. (Ebaid, 2018):

The software's objective nature, which prevents bias towards personal opinions and allows for the logical processing of all assigned data within the context of rapid modern digitization, is a double-edged sword. These technological solutions have not been without their detractors, with some researchers pointing out what they perceive as the darker aspects of technological advancement in qualitative analysis.

Criticisms often focus on the potential for these tools to encourage superficial analyses and the risk of distancing researchers from the deep, nuanced engagement with data that

traditional methods foster. Among these critics is researcher Seidel, who has vocally expressed concerns over the reliance on technology, articulating these issues as significant drawbacks to the progress in digital technology use for qualitative data analysis.

Amidst the rapid adoption of digital tools for qualitative research, critical voices such as researcher Seidel have expressed significant reservations, referring to these concerns as the "dark side" of technological progress. These criticisms underline the complexities and potential pitfalls associated with the use of digital technologies and software for qualitative data analysis:

It is impractical and perhaps unreasonable to expect researchers to analyze data without first thoroughly reading and familiarizing themselves with it. Digital tools often presuppose that data can be directly analyzed without such preliminaries, placing qualitative researchers in a predicament that demands more effort than traditional methods. This involves continuous re-reading of transcribed data and field notes, as well as multiple revisits to categorized segments to deepen and refine the analysis.

According to researcher Randall Parker, computer programs lack the capability to organize data initially, define interpretations, or derive explicit meanings autonomously. Furthermore, the retrieval of coded words using these tools does not necessarily clarify the context of the words or sentences, which is crucial for accurate qualitative analysis.

There is a risk of misunderstandings arising from discrepancies between the data entered by the researcher and the pre-

existing data within the program. Such issues could render the data incomprehensible or lead to misinterpretations, compromising the integrity of the research.

The efficiency and speed of digital technology might encourage researchers to undertake tasks that are unsuitable for digital analysis. This could lead to inappropriate applications of technology, where the tools used do not align with the specific needs of the research.

A single program may not be sufficient to accurately analyze a specific type of data, necessitating the use of multiple software applications to adequately address the complexities of a single phenomenon. (Abd elati, 2015)

These issues highlight the need for a balanced approach in the integration of digital tools in qualitative research. Researchers are advised not to rely solely on computer software for data analysis but to ensure that their unique insights and experiences, particularly in the analysis and interpretation of media and communication phenomena, are prominently featured in their work. Subtle nuances such as gestures, looks exchanged during in-depth interviews, and underlying meanings often require the intuitive involvement of the researcher and cannot be fully captured by computational methods alone.

6. The impact of artificial intelligence tools on qualitative media studies:

As a concluding element of our methodological progress in this research paper and to support the conceptual and methodological framework of this study, we decided to address the impact of AI

tools on qualitative media studies. This leads us to: a set of graphs was created to depict the relative benefits and application trends, as well as the evolution of AI-enhanced tools in qualitative media research.

The purpose of these figures is to capture and simplify valuable empirical insights, along with the complex factors driving technology-driven changes in qualitative analyses. Through data-driven graphs, this study addresses the gap between theoretical discussion and real-world phenomena, enhancing the cognitive and practical aspects of the argument. Therefore, the presentation relies on these graphs, which aim to illustrate the impact of AI tools on qualitative media studies, with an emphasis on the balance between efficiency and cognitive depth. The first model includes a bar chart comparing traditional and AI-enhanced tools in qualitative analysis, and the second model includes a timeline showing the evolution of AI-enhanced qualitative analysis tools. Finally, we discuss a pie chart representing the distribution of AI tools' use in qualitative media studies.

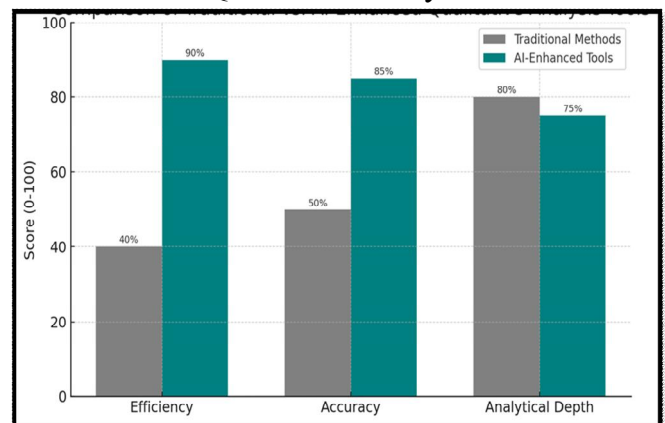
The follow bar picture (**Fig 1**) shows a comparison between manual methods of qualitative analysis (thematic mapping and coding) and AI-based tools like NVivo, ATLAS.ti, and Insight7.

As this graph shows the evaluation of qualitative analysis tools, on function and performance metrics; like efficiency, accuracy, and detail within the analysis sections. (Techtics.ai, 2024)

The findings show that AI-enhanced methods record vastly greater efficiency (90%) as well as accuracy (85%) when

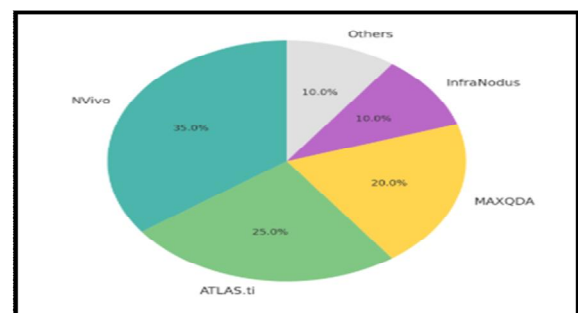
compared to the traditional sequential average of 40% in efficiency and 50% in accuracy. Nonetheless there remains slightly stronger traditional edge in analytical depth (80%) with AI tools trailing but still performing well (75%), which indicates strong promise regarding balanced integration persisting strong potential. (Enquery.ai, 2024)

Fig.1. Comparison of traditional Vs.AI-Enhanced Qualitative analysis tools



Source: (Techtics.ai, 2024)

Fig.2. AI Tool usage in qualitative media studies

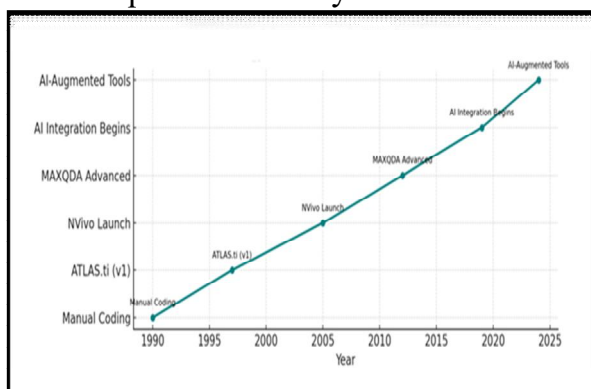


Source: (InfraNodus, 2024)

Overview on how qualitative research processes are divided among various ai programs The usage proportions distribution pie chart (**Fig2**) demonstrates the current outline concerning the proportion of ai-assisted tool user coverage at study media levels.

(InfraNodus, 2024) NVivo retains its maximum share advantage with thirty five percent owing to popularity emanating from his robust features concerning text and audiovisual data interactions. ATLAS.ti happens to follow with twenty five whilst MAXQDA registers twenty percent. InfraNodus captures ten percent especially among discourse focused studies where analyzing topics is paramount. (Techtics.ai, 2024)

Fig.3. Timeline of evaluation in qualitative analysis tools



Source: (Insight7, 2024)

The timeline(**Fig 3**) shows the progression of qualitative research tools from basic, manual techniques to AI-integrated systems.

This timeline captures important events concerning the development of qualitative analysis tools. For example, in the 1990s, researchers relied on manual coding. ATLAS.ti emerged in the late 1990s as the first digital coding software. Then in 2005, NVivo came out with advanced multimedia processing features. In 2012, MAXQDA improved usability by providing a better interface and advanced exporting options. A major paradigm shift happened around 2019 when artificial intelligence began being incorporated into analysis workflows. By 2024,

sophisticated AI-augmented systems were able to automatically code data, detect themes and sentiments which changed media data interpretation forever. (Insight7, 2024)

7. CONCLUSION

Most researchers find themselves in a dilemma that has persisted since the emergence of software designed for analyzing both qualitative and quantitative data, particularly qualitative data in the field of media. The key question remains: Can researchers dispense with traditional methods they are accustomed to in analyzing qualitative data in light of such software that offers ease from strenuous effort, reduces time, and provides seemingly infinite storage capacity? Or, instead of relying solely on these digital programs, should researchers maintain their imprint in qualitative research, particularly those new to qualitative studies, without risking the use of these programs?

Between these considerations, we must view the issue from a balanced perspective and not deviate toward one side at the expense of another. If we consider the critics of using software for analyzing qualitative data, we find that the difficulties arising from using these technologies are often linked fundamentally to digital illiteracy and a lack of sufficient familiarity with using directed programs for analysis, coding, or storage, etc.

Researchers in media and communication sciences should not completely negate their role in research and should not rely entirely on these softwares, for, despite their capabilities,

these programs have limits in execution according to the data provided by the researcher and can in no way replace the researcher's touch, capabilities, and expertise with the surrounding media and communicative environment and the communication phenomena that the researcher knows better than anyone else by virtue of their field experience.

Researchers wishing to use these digital technologies should be well-versed in operating these programs and understand their epistemological effects in the field of media and communication sciences, thus managing the impacts these leave on the analytical process, instead of allowing the nature of these programs to exceed their application context.

Ultimately, addressing these contentious questions requires researchers in the fields of media and communication studies, particularly qualitative studies, to exert effort in correctly handling these softwares and to have prior experience. We must recognize that technology serves as a tool, not an expert, and that no program is without flaws. Robust analysis of qualitative data requires the qualitative researcher's mental presence and skilled perception.

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