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Unveiling Digital Realms: A Systematic Review of Netnography Research in Library and Information Science

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Abstract: Netnography is an innovative qualitative approach that holds promise for investigating online phenomena. It has been gaining increasing popularity across disciplines in recent years. This study aims to provide a nuanced understanding of how netngoraphy has been applied in library and information science (LIS). A systematic review was conducted on 38 netnography studies published in LIS journals indexed in three academic databases. The findings reveal a growing trend of netnography research and a wide range of research topics of interest in the included studies. Of particular significance is the comprehensive analysis and discussion of various methodological aspects, including research design, data collection, data analysis, research ethics, and research rigor, within the context of netnography in LIS. The examination of methodological issues in current netnography research provides valuable insights and serves as a foundation for identifying potential opportunities for improvement in future studies.

Keyword: Netnography; Systematic review; Research design; Data collection; Data analysis: Research rigor; Research ethics

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1. Introduction

The proliferation of information and communication technologies, notably the prevalence of social media, has greatly impacted research methods, leading to a new era of online investigations focusing on digital spaces (Kozinets, 2020; Mesquita et al., 2018; Wittel, 2000). Within this transformative landscape, netnography, pioneered and continuously refined by Kozinets (1998, 2002, 2010, 2015, 2020, 2022), has emerged as a distinct qualitative approach.

Netnography, a specific variant of online ethnography, stands out through four defining elements that set it apart from other online ethnographic approaches. These include a cultural focus, reliance on social media data, immersive engagement, and adherence to netnographic praxis (Kozinets, 2020). Kozinets offers researchers procedural instructions and guidelines, outlining operational categories such as investigative, interactive, and immersive data collection. This comprehensive guidance provides researchers with the tools needed to effectively apply netnography for their specific research goals. Kozinets' clarification of these distinctive elements and practical guidance positions netnography as a robust and adaptable methodological framework in qualitative research.

In an era marked by unprecedented digital interconnectedness, netnography has been increasingly used to investigate online or digital traces and study online communities and interactions across disciplines, such as nursing, education, and tourism (Jensen et al., 2022; Salzmann-Erikson & Eriksson, 2023; Tavakoli & Wijesinghe, 2019; Whalen, 2018). In LIS, researchers employ diverse methods (Chu & Ke, 2017; Järvelin & Vakkari, 2022; Zhang et al., 2023) to explore a wide range of topics (Ma & Lund, 2021; Xu et al., 2016). Notably, online research constitutes a vital component of LIS research (Figuerola et al., 2017; Järvelin & Vakkari, 2022; Ma & Lund, 2021).

Netnography offers a unique lens for delving into the intricate connections among users, information, and technology within the digital realm in LIS research. LIS researchers have started to apply netnography to examine diverse topics, such as information seeking and sharing behaviors of librarians in online communities (Agyemang, 2021), interactions in online health communities (Zhao et al., 2020a, 2020b), and virtual social movements (McKenna, 2020). This diversified research underscores netnography's versatility and relevance in capturing and understanding the multifaceted aspects of user engagement, information dynamics, and technological impacts within the digital landscape.

2. Problem statement

Research methods hold a pivotal position in the LIS community where researchers have been dedicating themselves to methodological analyses for decades (Chu, 2015; Chu & Ke, 2017; Järvelin & Vakkari, 1990, 2022; Peritz, 1980; Tuomaala et al., 2014; Zhang et al., 2023). Netnography, as an innovative

qualitative method, has been increasingly used in multiple disciplines, and it can also be valuable for LIS researchers focusing on online phenomena. Despite its potential, there is a scarcity of systematic reviews on netnography research within LIS, though a few studies have examined the application of netnography in other fields (Bartl et al., 2016; Heinonen & Medberg, 2018; Jensen et al., 2022; Kaur et al., 2021; Salzmann-Erikson & Eriksson, 2023; Schuman et al., 2021; Tavakoli & Wijesinghe, 2019; Whalen, 2018). Analyzing existing netnography research in LIS can provide valuable insights into the methodological landscape of current netnography research within LIS, identify potential challenges that warrant attention in future research, and further equip LIS researchers with better knowledge of using netnography.

This study answers one central research question (RQ): How have LIS researchers applied netnography in their research? Specifically, the following RQs are addressed:
RQ1: What is the temporal trend of publication numbers of netnography studies?
RQ2: What research topics do LIS netnographic studies focus on?
RQ3: What are the characteristics of different methodological aspects (i.e., research design, data collection, data analysis, research ethics, and research rigor) in the LIS netnography research?

3. Literature Review

3.1 Ethnography and its use in LIS

The term "ethnography" originated in nineteenth century and early twentieth-century anthropology, initially denoting "a descriptive account of a community of culture, usually one located outside the West" (Hammersley & Atkinson, 2007, p.1). In essence, ethnography focuses on people and their culture within distinct spatial and temporal boundaries (Van Maanen, 2006). Ingold (2014) views ethnography as "writing about the people" (p. 385) and contends that while it undoubtedly has its methods, it is "not a means to something else" (p. 390). Presently, ethnography is widely conceptualized as a form of research, a qualitative research design, and a methodology. Hammersley (2006) asserts that ethnography is a type of social and educational research emphasizing the significance of firsthand exploration of people's actions and expressions in specific contexts. According to Creswell and Creswell (2018), ethnography is a qualitative research design where researchers investigate "the shared patterns of behaviors, language, and actions of an intact cultural group in a natural setting over a prolonged period of time" (pp. 50–51). Regarding methodological procedures, Griffin (2017) raises concerns about the ambiguity between ethnography as a methodology and specific ethnographic methods-as-tools (e.g., interviews, participant observation) in LIS. He argues that ethnography is best understood as a methodology rather than a single method. Griffin's (2017) statement aligns with Asher and Miller's (2011) perspective of ethnography as

"a collection of qualitative methods that focus on the close observation of social practices and interactions" (p. 3). Individual methods, like interviews, should not be simply labeled as ethnographic without considering the unique research context in which they are applied.

Ethnography encompasses a range of research activities, which include "participation, observation, listening, asking questions and collection of any kind of data that is instructive for the issue of research" (Flick, 2018, p. 326). Epistemologically grounded in naturalism, ethnography requires researchers to "live" in the communities under investigation for a relatively expanded period possibly ranging from months to years (Hammersley, 2006). As described by Creswell and Poth (2017), "ethnography involves prolonged observations, often through participant observation, where researchers immerse themselves in the day-to-day lives of the people, observing and interviewing participants". Researchers can benefit from using ethnography, including its capacity to provide deeper insights into subjects' experiences and generate rich and authentic data, its contextual awareness, ability to reveal nuances, and flexibility in adopting research methods to address specific research problems (Khoo et al., 2012).

As the use of ethnography in LIS continues to expand, Khoo et al. (2012) conducted one of the earliest studies overviewing the use of ethnographic methods in LIS, and they identified an increasing number of ethnographic studies, with observation and interviews being the two dominant and widely applied methods. Similarly, some studies (Chu, 2015; Chu & Ke, 2017; Hider & Pymm, 2008) have also included ethnography in their analyses of research methods used in LIS. For example, Hider and Pymm (2008) noted a well-established presence of ethnography in high-profile LIS journal papers published in 2005.

3.2 Netnography as an emergent ethnographic approach

Ethnography has been evolving and transforming, extending from physical spaces to digital spaces (Wittel, 2000). According to Kozinets (2020), social media can be broadly seen as "applications, websites, and other online technologies that enable users to engage in a variety of content creation, circulation, annotation, and association activities" (p. 4). He further proposed netnography as an approach to researching social media and associated experiential and cultural interactions. He defined netnography as "a form of qualitative research that seeks to understand the cultural experiences encompassed and reflected within the traces, practices, networks, and systems of social media" (Kozinets, 2020, p. 14).

Netnography has a centered focus on "online traces" (e.g., user-generated content and social interactions on social media), and "all netnographies involve collecting, participating, and interpreting online traces" (Kozinets, 2020, p. 16).

As Kozinets (2020) and other researchers (Tunçalp & Lê, 2014; Udenze, 2019) have noted, online ethnography could be considered a generic methodological category, and there have been various associated method-related terms, such as netnography, digital ethnography, virtual ethnography, cyber ethnography, Internet ethnography, social media ethnography, webnography, among others. There are four elements that distinguish netnography from other methods, including a cultural focus, reliance on social media data, immersive engagement, and adherence to netnographic praxis (Kozinets, 2020). Specifically, the cultural focus reflects netnographic research's attention to understanding cultural phenomena, social media data highlights the dominance of social media data usage in netnography, immersive engagement emphasizes netnographers' active roles of participating throughout the research process, and netnographic praxis features the availability of procedural guidelines for conducting netnographic research.

In addition, different from other types of online ethnographic approaches that lack clear instructions, netnography is a pragmatic approach that equips itself with a specified set of up-to-date and pragmatic research practices and procedural guidelines available for researchers to adopt for their own purposes (Kozinets, 2020; Kozinets & Gretzel, 2023). Kozinets (2020) proposed seven main operation categories, including research focus operation (i.e., initiation), investigative data-collection operations (i.e., simplification, searching, scouting, selecting, and saving), interactive data-collection operations (i.e., interviews, involvement, innovation, and informed consent), immersive data-collection operations (i.e., reconnoitering, recording, researching, and reflecting), data analysis operations (i.e., collating, coding, combining, counting, and charting), data interpretation operations (i.e., theming, talenting, totalizing, translating, turtling, and troublemaking), and research presentation or communication operation (i.e., incarnation). Recently, Kozinets and Gretzel (2023) pointed out that netnography research contains six main movements, including initiation (required), immersion (required), investigation, interaction, integration that combines data analysis and interpretation (required), and incarnation (required).

3.3 Application of netnography in research

A few studies have examined the application of netnography and associated methodological aspects in different fields (Heinonen & Medberg, 2018; Jensen et al., 2022; Kaur et al., 2021; Salzmann-Erikson & Eriksson, 2023; Schuman et al., 2021; Tavakoli & Wijesinghe, 2019; Whalen, 2018). Netnography can be categorized into two primary types: normal netnography, which includes both participatory or non-participatory approaches, and auto-netnography. Tavakoli and Wijesinghe (2019) observed that in the field of tourism, the predominant approach is normal netnography, with only a limited number of auto-netnography studies. In hospitality and tourism research, the non-participatory approach is more common than the participatory approach (Whalen, 2018).

In terms of research sites, Tunçalp and Lê (2014) delved into how researchers defined boundaries and engaged with their online fields in management literature. Their findings revealed that a similar number of researchers chose to either limit their focus to a single site or utilize multiple sites. The former choice was often motivated by reasons such as the research object exclusively existing on a single site. The latter choice was primarily made for the purpose of cross-case comparison. Heinonen and Medberg (2018) analyzed netnography studies published in marketing journals, finding that online discussion forums, review sites, social networking sites, blogs were the common platforms where researchers conducted their studies.

Various data collection methods can be employed in netnography. According to Tavakoli and Wijesinghe (2019), interviews and fieldwork were the most used data collection methods in netnographic tourism studies, followed by document analysis, focus groups, and questionnaires or online surveys. In the marketing field, diverse data collection methods were used in netnogrpahy studies, such as interviews, observations, diaries, surveys, and introspections (Heinonen & Medberg, 2018). According to Jensen et al. (2022), a notable preference was given to unobtrusive methods for data collection in netnographic higher education research, with only a limited number of studies employing participatory approaches.

Various data analysis methods have been employed in netnography research. Tavakoli and Wijesinghe (2019) identified thematic analysis, content analysis, coding, and discourse analysis as prevalent in tourism research. In hospitality and tourism research, thematic analysis, content analysis, and discourse analysis are predominant, with a few studies incorporating textual analysis, mapping, and grounded theory (Whalen, 2018). Likewise, marketing research also relies on thematic analysis, content analysis, and discourse analysis (Heinonen & Medberg, 2018).

Researchers have also examined research ethics in netnography. For example, when reviewing the use of netnography in nursing, Salzmann-Erikson and Eriksson (2023) discovered that only 26.4% of analyzed articles reported that they had been reviewed by an ethics board, while 56.6% did not. Similarly, Schuman et al. (2021) discovered that most studies employing online ethnography in military studies did not implement adequate ethical safeguards. To tackle this issue, they put forth a set of best practices, encompassing user rights, consent and permission, researcher disclosure, and so forth. Furthermore, research rigor has also been an overlooked aspect. Tavakoli and Wijesinghe (2019) found that only 19 out of 116 tourism netnographic papers incorporated research reflexivity. In netnographic higher education research, most reviewed papers lacked descriptions concerning research rigor. It remains unclear whether this signifies a deficiency in research rigor or merely insufficient reporting (Jensen et al., 2022).

4. Methods

4.1 Literature search

The systematic review approach (Liberati et al., 2009) was follwed to provide a comprehensive view of netnography research in LIS. The review team consisted of one faculty member with a doctoral degree in library science and two doctoral students majoring in LIS. Three academic databases were used, including Web of Science (WoS) Core Collections (the "Information Science Library Science" category), Library Literature & Information Science Full Text (LLIS), and Library, and Information Science & Technology Abstracts with Full Text (LISTA). These databases cover an extensive selection of LIS journal literature, and they have been used, solely or in combination, in multiple reviews or literature analysis papers in LIS (Lasić-Lazić et al., 2017; Xie et al., 2021). A general search term "netnograph*" that covers relevant descriptors (i.e., netnography, netnographic, auto-netnography, auto-netnographic, autonetnography, and autonetnographic) was used to identify and include relevant literature. Literature searches were conducted in September 2022. Table 1 shows the search strategy used in each database.

Table 1. Literature search strategies in three databases.

Database	**Search field**	**Search term**	**Limiter**
Web of Science (WoS) (the "Information Science Library Science" category)	Topic	netnograph*	Publication year: up to 2021
Library Literature & Information Science Full Text (LLIS)	Basic search	netnograph*	Publication year: up to 2021
Library, Information Science & Technology Abstracts with Full Text (LISTA)	Basic search	netnograph*	Publication year: up to 2021

4.2 Eligibility criteria

A set of inclusion and exclusion criteria were applied to identify relevant studies for analysis. First, articles in which researchers applied the netnography approach in empirical studies were included. Some studies solely used nethonography while others applied netnography in combination with other methods. Both types of studies were included. Articles only mentioning nentnography but not applying netngography were excluded. Second, included articles were published by 2021. Third, only articles written in English were considered. Fourth, articles needed to be published in LIS-focused journals. In line with Jamali's (2018) study, it was not assumed that all journals indexed in the searched databases were LIS-focused. Instead, the editorial websites of the

retrieved journals were checked whether their scopes focused on LIS topics (Han, 2020; Järvelin & Vakkari, 2022; Liu & Yang, 2019). Besides, research on categorizations of LIS journals (Abrizah et al., 2015; Huang et al., 2019) were consulted to assist our relevance judgement of journals. 22 journals (e.g., Journal of Documentation, The Electronic Library, and International Journal of Information Management,) from the search results were categorized as LIS journals in this study, while 12 journals (e.g., Service Marketing Quarterly, Journal of Nonprofit & Public Sector Marketing, and Qualitative Health Research) were excluded. As a result, 38 articles constituted the final data set for analysis. Figure 1 outlines the literature searching and screening process.

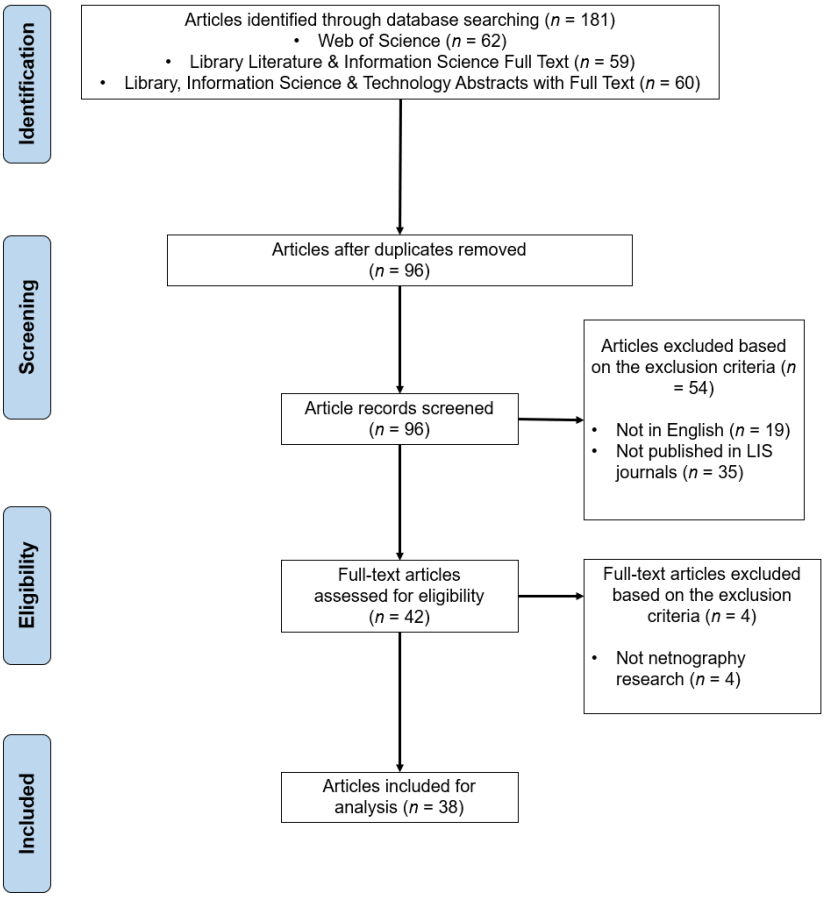

Figure 1 Research articles processing workflow

4.3 Data analysis

Qualitative content analysis was applied to analyze the research topics and methods of the included articles (Graneheim et al., 2017; Neuendorf, 2017). First, a list of LIS topics was proposed based on previous research categorizing LIS topics (Järvelin & Vakkari, 2022; Ma & Lund, 2021; Tuomaala et al., 2014), including: (1) library and information professions; (2) history of libraries, publishing, and books; (3) methodology; (4) education in LIS; (5) library and information institutions and services; (6) information systems and technologies; (7) information organization, storage, and retrieval; (8) users studies and information behavior research; (9) information and knowledge management; (10) information ethics, policies, and security; (11) scientific and professional communication; and (12) other topics. Each article was assigned one main topic. Then, a coding protocol for analyzing methodological elements was developed based on Kozinetns' (2020) guide for netnography research as well as relevant review and content analysis studies concerning the application of netnography across disciplines (Kaur et al., 2021; Schuman et al., 2021; Tavakoli & Wijesinghe, 2019; Tunçalp & Lê, 2014; Whalen, 2018). The coding protocol consists of the following elements: research design (open text field), netnography type (i.e., participatory, non-participatory, autonetnography), online research site (open text field), number of online research sites (i.e., single, multiple), data type (i.e., investigative, interactive, and immersive), data collection method (open text field), data analysis method (open text field), research rigor (open text field), and research ethics (open text field).

The coding process went through three stages. First, ten papers (26%) were randomly selected from the entire sample and conducted a pilot coding session. In this process, each author reviewed and coded each selected paper independently focusing on the abstract and method sections. For those methodological elements with open text fields in the coding protocol, codes were inductively assigned based on authors' explicit statements. The coding results from the pilot coding session were compared, discussed, and finalized in group discussion sessions. A high percentage of consistency was reached in the pilot coding session. Subsequently, two authors continued to finish coding the remaining articles. Both test-retest reliability and inter-coder reliability methods were applied to improve the trustworthiness of the coding results. Each of the two authors independently went through the sampled articles and iteratively revised their codes during a period of five months. Coding results from the two authors were compared, and less than ten differences were detected. Group discussions were held among authors to address disagreements and finalize the coding results. Finally, all the finalized coding results were integrated.

5. Findings

5.1 Literature profile

Table 2 summarizes all the journal sources and their published netnography articles. In total, 38 netnography research articles were included in this study. These articles were published in 22 journals. The top three journals publishing

most netnography study articles in LIS were International Journal of Information Management (5), Journal of Knowledge Management (3), and Online Information Review (3). The remaining journals published one or two netnography study articles. Figure 2 illustrates the progressive adoption of netnography in LIS journalsfrom 2010 to 2021. Notably, 18 articles (47.4%) were published in 2020 and 2021, accounting for almost one half of the sampled studies.

Table 2. Journal sources of netnography research articles in LIS

Journal source	**Number of articles**	**Article**
International Journal of Information Management	5	Arruda-Filho & Lennon (2011) Arruda-Filho et al. (2010) Habibi et al. (2014) Lamb et al. (2020) Zhou et al. (2021)
Journal of Knowledge Management	3	Chua & Banerjee (2013) Del Vecchio et al. (2020) Ietto et al. (2021)
Online Information Review	3	Au & Ho (2021) Bhattacharyya & Dash (2020) Wang (2019)
Information, Communication & Society	2	Ilich & Hardey (2020) Murru & Vicari (2021)
Electronic Library	2	Huang & Yang (2014) Zhao et al. (2020b)
Journal of Documentation	2	Burford & Park (2014) Graminius & Haider (2018)
Information Systems Journal	2	Germonprez & Hovorka (2013) McKenna (2020)
Library Hi Tech	2	Au & Ho (2020) Zhao et al. (2020a)
Information Systems Research	2	Bauer et al. (2016) Tarafdar & Kajal Ray (2021)
Information Technology & People	2	Dey et al. (2018) Potdar et al. (2018)
Behaviour & Information Technology	2	Dehghani (2018) Wang (2020)
School Libraries Worldwide	1	Moreillon (2015)
Journal of the Association for Information Systems	1	Park et al. (2019)
Romanian Journal of Library & Information Science / Revista Româna De Biblioteconomie Si Stiinta Informarii	1	Rojișteanu(2017)

Information Polity	1	Waxa & Gwaka (2021)
Information Development	1	Boateng (2016)
Journal of Global Information Management	1	Borodako et al. (2021)
Pacific Asia Journal of The Association for Information Systems	1	Prakash & Das (2020)
Information Research-An International Electronic Journal	1	Harr et al. (2016)
Bottom Line	1	Chen et al. (2018)
Journal of Librarianship and Information Science	1	Agyemang (2021)
Investigacion Bibliotecologica	1	Santana Júnior & Lima (2019)

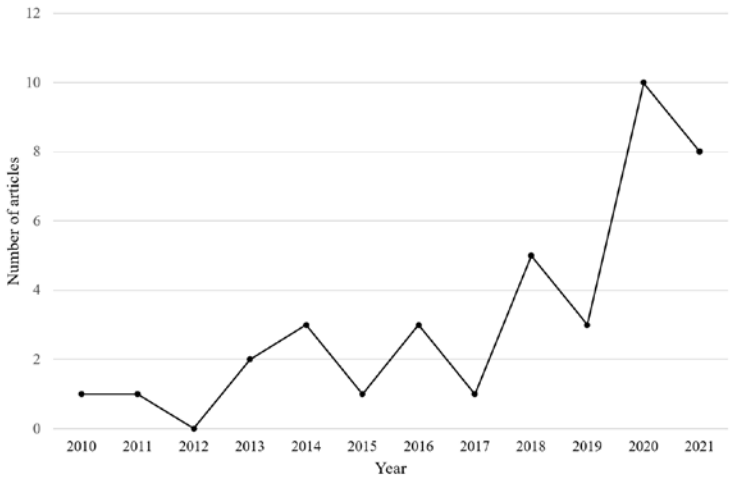

Figure 2 Annual number of articles

The included studies examined multiple LIS topics, including user studies and information behavior research (24), information technologies (6), information and knowledge management (4), library and information institutions and services (2), as well as methodology (1) and information ethics and law (1). The prevalence of netnography in user studies and information behavior research may be attributed to the unique advantage of netnography in exploring information-related phenomena within diverse online communities, allowing researchers to observe and analyze online interactions. Also, the immersive nature of netnography enables a nuanced understanding of user experiences and behaviors in the digital environment.

5.2 Research designs

As Table 3 suggested, some researchers used more high-level terms (i.e., qualitative design, mixed methods design), while others went more specific (i.e., case study, netnography, and grounded theory). Netnography (26) was found to be the most common research design, followed by case study design (9), mixed methods design (5), qualitative research design (2), and grounded theory (1). Moreover, there were six studies in which researchers claimed to involve two research designs. For example, Boateng (2016) "employed case study and netnography as research design" (p. 440).

Table 3. Research designs of the sampled studies

Research design	**Number of articles**	**Sample excerpt**
Netnography	26	"Netnography as a research design was used in this study" (Agyemang, 2021, p. 1).
Case study	9	"The paper has adopted a case study research strategy to understand the drivers influencing customer churn behavior in an Indian context" (Bhattacharyya & Dash, 2020, p. 180).
Mixed methods	5	"As an exploratory study, mixed (qualitative and quantitative) data gathering, and analysis methods were adopted. The study is based on a triangulation between qualitative (interviews and netnography) and quantitative methods (survey questionnaire)" (Waxa & Gwaka, 2021, p. 446).
Qualitative design	2	"Therefore, we have followed a qualitative research design using interviews and principles of netnography to collect data" (Chen et al., 2018, p. 23).
Grounded theory	1	"This research adopted an adapted grounded theory approach, underpinned by a positivist epistemology" (Ilich & Hardey, 2020, p. 5).

5.3 Netnography types

Netnograhphy could be participatory or non-participatory based on researchers' roles in online sites or communities under study. As Table 4 shows, most of the included papers (27) were non-participatory, in which researchers were merely outsiders; in contrast, 11 papers were participatory nentnography. Participatory researchers were engaged members of online communities under study, taking the stance of participant observers as both insiders and outsiders. No auto-netnography study was found in the sample.

Table 4. Netnography types of the sampled studies

Netnography type	**Number of articles**	**Sample excerpt**
Participatory netnography	11	"The researchers, as part of the online community were also observers of all digital

		communications and recorded their observations and descriptions of information behaviour throughout the year" (Burford & Park, 2014, p. 629).
Non-participatory netnography	27	"Non-participant netnography was used to allow researchers to capture the spontaneous and available flow of communication amongst consumers" (Arruda-Filho & Lennon, 2011, p. 526).

5.4 Research sites

The top three most widely used online sites or platforms were Facebook (17), Twitter (14), and Instagram (4). All these three were social media platforms "where people form communities in which they create, exchange, comment, recreate, and cocreate content" (Karahanna et al., 2018, p. 738). Moreover, most of the sample studies (27) only focused on one online site in one study. For example, Wang (2019) took the iPartment online dating site as the only research site. Multiple online sites were selected in 11 studies. For example, two social media platforms Facebook and Twitter were used by Boateng (2016) to collect relevant data.

5.5 Data types and data collection methods

There are three main data types in netnography research, including investigative, interactive, and immersive data. Investigative data (37) were the most frequent data type used, followed by interactive data (14) and immersive data (11). Of note, most interactive data were interview data in addition to two studies (Huang & Yang 2014; Wang, 2019) explicitly mentioning that researchers engaged with participants or participated in online communities. In terms of data types per study, more than one half of the sampled studies (20) only relied on one of the three data types, 19 of which exclusively used investigative data. Moreover, 12 studies counted on two data types, and only six articles used all three data types. It is worth noting that investigative data were prevalently used in all the 18 studies relying on multiple data types.

Corresponding to the three data types, different data collection methods were employed. The most widely used data collection method was searching, selecting, and saving (37), which echoes the prevalence of investigative data used in netnography. In addition, observation (22), interviews (e.g., online interviews, in-person interviews, email interviews, and key informant interviews) (12), and field notes (7) were also commonly used. Some less used methods included surveys (3), diaries by participants (2), among others. In terms of numbers of applied data collection methods, 11 sampled studies only used one data collection method (searching, selecting, and saving), and the remaining studies used two or more data collection methods.

5.6 Data analysis methods

Due to the qualitative nature of netnography, qualitative data analysis methods and techniques unsurprisingly topped the list of the most frequently used analysis methods. Specifically, the most used analysis methods were thematic analysis (12), open coding (10), axial coding (7), content analysis (5), selective coding (4), and descriptive statistics (4). Some less frequently applied analysis methods included phenomenological analysis, template analysis, semiotic analysis, comment stream analysis, among others.

5.7 Research ethics

Not all included netnography studies considered research ethics in their method statements. Specifically, about one half of the included papers (18) did not address research ethics. In the 20 papers addressing research ethics, the most discussed issues were de-identification of participants (e.g., pseudonymization, anonymization) (12), informed consent (5), researcher disclosure (5), and confidentiality (4).

5.8 Research rigor

Research rigor or quality has been discussed in 25 of the 38 papers. In terms of terminologies, researchers may use different terms when addressing issues concerning research rigor or quality (Creswell & Miller, 2000; Lincoln, 1995; Morse, 2015). It was found that ten papers explicitly referred to "reliability," nine papers discussed "validity," three papers addressed "credibility," and two papers attended to "trustworthiness." Furthermore, multiple validation strategies or techniques were used in the sampled studies, including triangulation (e.g., method triangulation, data triangulation, and investigator triangulation) (18), saturation (e.g., data saturation, theoretical saturation) (6), inter-coder reliability (6), member checking (4), debriefing (e.g., peer debriefing) (2), thick description (1), prolonged engagement (1), and audit trail (1).

6. Discussion

6.1 Research designs in LIS netnography research

Diverse research designs were claimed in LIS netngoraphy research. This might be related to different categorizations of research designs based on varying levels or criteria. For example, Creswell and Creswell (2018) broadly presented three main types of research designs or approaches, including qualitative designs, quantitative designs, and mixed methods designs. Bhattacherjee (2012) regarded a research design as "a comprehensive plan for data collection in an empirical research project" (p. 35) and listed a few popular research designs, including experiment studies, field surveys, secondary data analysis, case research, focus group research, action research, and ethnography. Specifically focusing on qualitative research designs, Creswell and Poth (2018) attended to five qualitative designs, including narrative research, phenomenological research, grounded theory research, ethnographic research, and case study

research. Ideally, researchers need to explicate their selection of research designs in individual studies and provide convincing rationale to support their decisions (O'Brien et al., 2014). Readers may be confused by case study, grounded theory, or other approaches being research designs of studies where netnography has been applied, because for many readers, they may assume that the research design of a netnography study is netnography since ethnography is the research design of most if not all traditional onsite ethnography research.

6.2 Nenography types in LIS netnography research

Non-participatory netnography has been widely applied, while participatory netnography accounts for a small portion of the sampled studies. This pattern is consistent with findings in other fields, such as higher education (Jensen et al., 2022) and hospitality and tourism research (Whalen, 2018). For instance, Jensen et al. (2022) discovered that most observational data in netnographic higher education research were collected by non-participant lurking researchers. Undoubtedly, non-participatory netnography has its own advantages, such as unobtrusiveness, access to naturalistic data, and low time requirements (Habibi et al., 2014; Kozinets, 2020). However, non-participatory netnography research may company a lack of ethical considerations (e.g., no informed consent from participants); researchers adopting a passive non-participatory approach will miss opportunities of collaborating with their participants to create new knowledge (Costello et al., 2017).

Also importantly, participatory netnography is not necessarily obtrusive when the relationships between researchers and participants are ethically handled (e.g., gaining permissions for entering research sites, researcher disclosure, and obtaining informed consent from participants). As Liamputtong (2007) suggested, it is essential for researchers to be open to their participants willingly share experiences with their participants to establish and enhance rapport. When getting involved in participatory research, researchers' positionality in qualitative research should be considered. Conducting participatory netnography research may be of particular interest to researchers from online communities consisting of vulnerable populations (e.g., migrants, LGBTQ people, and ethnic minorities) who usually have better knowledge of different aspects of their studied communities (e.g., community culture, language, and policies) than outsider researchers. These researchers can engage and empathize with their participants, thus helping understand important yet sensitive issues that may not be accessed nor studied by outsider researchers. The advocate for conducting participatory netnography is to advance towards the "the outcome of empathy" that "powers a good netnography" (Kozinets, 2020, p. 186).

Moreover, auto-netnography, an approach to netnography that focuses on researchers' own experiences was not found among the sampled studies. This under-representation prevails in other fields such as tourism (Tavakoli &

Wijesinghe, 2019), indicating a research gap and potential room for future research. Auto-netnography enables researchers to reflect on their own experiences and helping provide nuanced insights into online communities or phenomena from the perspectives of native researchers in online communities or cultures. Again, researchers from online communities of vulnerable populations may contribute to such scholarly works.

6.3 Research sites in LIS netnography research

Most included studies focused on one rather than multiple online sites, resonating with Tunçalp and Lê's (2014) finding that more online ethnography research centered on a single site instead of multiple sites. Beyond merely focusing on single-site research, netnographers may consider involving multiple online sites because people are likely to belong to different online communities, which echoes Marcus's (1995) proposal of multi-sited ethnography.Integrating online and offline sites may also be important because online communities consist of real people, and people connected online often know each other offline in real life. Most importantly, people's online and offline life has been intertwined, creating an integrated social realm (Fernback, 2007).

In addition, Facebook and Twitter were the most popular platforms investigated in LIS netnographic research. The extensive exploration of these platforms in LIS netnographic studies signifies a recognition of the significance of social media in information-related behaviors and interactions. It is also noteworthy that researchers from non-English contexts such as developing countries may focus on digital platforms that are popular in their own countries.

6.4 Data collection and analysis methods in LIS netnography research

It is not surprising that investigative data or archival data of online platforms have been dominantly used because of ease of access and convenience. Endorsing data triangulation, Kozinets (2020) suggests that researchers use two or three data types (i.e., investigative, interactive, and immersive data) in one netnography research project. To do so, researchers should apply different data collection methods. The most popular data collection method was searching, selecting, and saving of social media data, followed by observation, interviews, and other methods. This trend aligns with Jensen et al.'s (2022) findings in netnographic higher education research, where text-based data (such as discussion board posts, chats, or comments on social media) were the most commonly collected data. However, in netnographic tourism studies interviews and fieldwork emerged as the most commonly used data collection methods (Tavakoli & Wijesinghe, 2019). This divergence in data collection methods between disciplines highlights the need for researchers to tailor their approaches based on the unique characteristics of their subject matter. The multifaceted nature of netnography, coupled with the dynamic digital environment, necessitates an ongoing exploration of innovative data collection methods. This

exploration becomes crucial in unraveling the intricacies of online phenomena across diverse domains.

Diverse methods were used in the sampled studies. In line with previous studies (Heinonen & Medberg, 2018; Tavakoli & Wijesinghe, 2019; Whalen, 2018), thematic analysis, content analysis, and different coding techniques (e.g., open coding) were frequently used in LIS netnography research. In contrast with previous studies (Heinonen & Medberg, 2018; Tavakoli & Wijesinghe, 2019; Whalen, 2018), discourse analysis was not used in any of the sampled studies. Notably, there are also other alternative data analysis methods that can be used in future netngoraphy research, such as conversation analysis, one dominant method for studying social interactions (Stivers, 2015) that has been found applicable and useful for understanding online interactions (Meredith, 2017, 2019).

6.5 Research ethics and rigor in LIS netnography research

The results signaled needed attention to research ethics and rigor in LIS netnography research, resonating with findings of previous research (Tavakoli & Wijesinghe, 2019; Whalen, 2018). Research ethics should be deliberately considered throughout the entire research process of qualitative research, including netnography (Cutcliffe & Ramcharan, 2002; Kozinets, 2020;). Specifically, netnographers may consult "A research ethics process flowchart for netnography" proposed by Kozinets (2020, p. 179) to guide their ethical undertaking of research. Interestingly, it was found that researchers had conflicting opinions towards research ethics in netnography. For example, some scholars maintain that keeping participants from knowing researchers' presence is ethical (Zhao et al., 2020a, 2020b), while Kozinets (2020) recommends that researchers inform participants and obtain their consent for ethical considerations. For future research, it is worthwhile to explore how researchers' understandings of research ethics converge and diverge in different contexts. To achieve research rigor, O'Brien et al. (2014) suggest that researchers report techniques or methods used for enhancing trustworthiness in qualitative research. It is worth noting that about one third of the included studies did not report research rigor in their method statements, and authors of the sampled studies mainly relied on techniques such as triangulation and inter-coder reliability, while other techniques (e.g., debriefing, member check) were used less frequently.

6.6 Limitations of the study

This study also has its limitations. All included journal articles were in English, which may cause some bias in the findings. In addition, the sample of this study covers research papers in three databases, and relevant netnography studies indexed in other databases were not included.

7. Conclusion

This study has delved into the burgeoning realm of netnography, an innovative qualitative approach that shows promise in unraveling the complexities of online phenomena. Through a meticulous examination of research design, data collection, data analysis, research ethics, and research rigor, this study provides valuable insights into the methodological landscape of current netnography research within LIS. This scrutiny not only highlights the methodological richness within existing studies but also identifies key challenges that warrant attention. The identified methodological issues serve as a foundation for recognizing potential opportunities for improvement in future netnography research. As online phenomena continue to evolve, the insights gleaned from this systematic review contribute to the ongoing discourse on effective research methodologies in LIS, ultimately fostering a more nuanced and sophisticated understanding of the applications and challenges associated with netnography in this dynamic field.

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