"If We Had the Option": Infrastructuring for Access to Online Subscription-Based Services in Bangladesh

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As online access to entertainment, education, news, and information increasingly becomes mitigated through subscription-based services, it is important to study how inequities in access impact users in low and middle-income countries (LMICS), and what infrastructuring strategies they employ to overcome obstacles. In this paper, we present findings from an interview study with 22 participants from Bangladesh who use and share online subscription-based services. Due to the lack of availability and limitations using formal international payment methods, procedural difficulties, and infrastructural challenges in Bangladesh, we found an emergence of a distinct informal ecosystem of accessing, sharing, and using subscription-based services. We report a detailed analysis of the adoption, sharing practices, and dynamics of sharing online subscription-based services in Bangladesh, that builds on and extends previous HCI literature on informality, informal marketplace, intermediaries, and media sharing in the Global South. Our findings show how a vibrant and growing user base of subscription-based online services is using creative and sometimes risky ways to gain access to media and information through informal intermediaries and administrators. Finally, we discuss potential directions for practice and policy innovations that include facilitating international payments for online services and platforms and reconsidering their policies and service delivery mechanisms to better support users in the Global South context.

CCS Concepts: • **Human-centered computing** → **Empirical studies in HCI**.

Additional Key Words and Phrases: Account sharing, Streaming, Infrastructuring, Bangladesh, Digital Access, Subscription-based Services, Intermediaries, Cashless Transactions, Financial Technologies, Digitization, Mobile Financial Services

1 Introduction

Online cloud-based subscription-based services, such as Netflix, Amazon Prime Video, Coursera, and others, have become increasingly popular and important for accessing resources like entertainment, education, and news in recent years [5, 51]. Sharing accounts to access these services is a common practice among users. The sharing of online resources is a significant feature of our digitally connected age [4, 7]. However, the availability and accessibility of these services vary depending on users' economic conditions, geographic locations, and access to robust internet connectivity, among

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other factors [49]. As many of the important platforms that provide these services are based in the Global North (i.e., the US and Europe), they are not equally accessible in many parts of the world due to difficulties in payment, cultural differences, and lack of information [43]. As these services gain momentum as important, if not essential, access points to digital resources and content, it is important to understand equity issues faced by their users in the Global South. Insights gained can add to the literature on creating localized infrastructure to support equitable access to services and products in the Global South (e.g., [19, 20, 43]).

Many of the most popular online resources and content-providing platforms, such as Netflix, Amazon Prime Video, Scribd, Edx, and Coursera, do not offer users in Bangladesh the opportunity to pay for their services in the local currency. For example, Netflix has the option to pay for their services from Bangladesh only in USD (United States Dollar), not in BDT (Bangladeshi Taka) [11, 12], whereas in many other countries in the region, such as in India, users have the option to pay in local currency. Users in Bangladesh who want to pay for Netflix's service have to use a dual currency debit or credit card, which is difficult to have and not common or convenient among local users. Furthermore, the subscription cost for a Netflix premium account in Bangladesh is currently 9.99 USD per month [12]. While this is lower than the cost of the same account in the US, which currently costs 19.99 USD [13], this difference is not nearly comparable to the two countries' relative income levels and other economic factors [16].

In this paper, we present findings from an interview study where we investigated what are the current online account-sharing practices, experiences, and strategies among young people in Bangladesh. We paid particular attention to barriers imposed by inequitable conditions, such as limited access to international payments necessary to access accounts, on participants and how they overcome them through engaging with them informally and through grassroots infrastructuring strategies. Our findings demonstrate how a vibrant and growing user base of subscription-based online services has to use creative and sometimes risky ways to gain access to media and information that is relatively much easier to access to people in the Global North. Following LeDantec and DiSalvo, we draw on infrastructuring [35, 50], which refers to the creation of "socio-technical resources that enable adoption and appropriation beyond the initial scope of design" [18] p.247, to understand the grassroots strategies of our participants in accessing and sharing subscription accounts in Bangladesh. Our findings further show the emergence of a distinct online ecosystem centered on account sharing, the study of which offers an opportunity to explore privacy perceptions, trust, and cultural factors that are at play behind online subscription-based account sharing.

2 Background

Participants for our study come from the urban regions of Bangladesh, which include the capital Dhaka, the second largest city Chittagong, and another divisional city Rajshahi. Bangladesh is situated in south Asia, often categorized among Low-and Middle-Income Countries (LMICs) [32], and part of the global south in terms of socio-economic and political characteristics. A description of the current banking system in Bangladesh and the informal marketplaces in the country provides an important context for our study.

The banking sector of Bangladesh consists of public and private banks where the Bangladesh Bank works as the regulatory authority to dictate policies regarding financial transactions. The private and public banks of Bangladesh provide dual currency debit, credit, and prepaid cards to do international transactions. However, for international transactions, users have to endorse the amount they wish to spend in international currency (mainly USD) on their passports due to regulations by Bangladesh Bank [6]. This endorsement can be done by going to the respective banks in person, and then the banks can enable the gateway to do international transactions according to the customer's request. There has been a proliferation of mobile banking services provided

Fig. 1. (from left to right) The underground market in Dhaka, where electronic media and equipment are historically repaired and traded; the electronic waste recycling market at Old Dhaka, where discarded electronics are disassembled and sold; and a memory card shop where religious digital media contents are sold and loaded in memory cards.

by private and public banks in Bangladesh recently [43], which enables users to do financial transactions in local currency through mobile phones.

Bangladesh has also attracted the attention of HCI scholars due to the different informal marketplaces that exist there. HCI scholars have studied the Gulistan underground market for mobile repairs in Dhaka [15], electronic waste recycling sites in old Dhaka [39], and the religious media content selling and sharing ecosystem in Bangladesh [40]. The common feature of these informal marketplaces (Figure 1) is that they are locally and historically situated in specific places and depend on local crafts, collaboration practices, and cultural-religious norms. We had been engaging with communities associated with these informal marketplaces for six years as part of different research projects. Through these interactions and everyday experiences, we noticed parallels between practices in physical informal marketplaces and online spaces. The current study focuses on how these informal practices transform online spaces due to the payment difficulties for accessing subscription-based services.

3 Literature Review

3.1 Account Sharing: What, Who, How, and Questions of Privacy

A large number of studies have explored who shares accounts in different capacities and contexts in the Global North [22, 26, 29, 34, 47, 54]. Most previous research in this area has mentioned friends, family members, roommates, office colleagues, and couples who are or were in romantic relationships as people who share online accounts for subscription-based services. Most studies have identified the existence of an interpersonal relationship among the sharing members as a key factor [25, 29]. This interpersonal relationship can be defined as a "close association between individuals who share common interest and goals [25]" A study [54] that investigated how small social groups navigate cybersecurity and privacy collaboratively has used the categorization of common bond groups (who are bound by intimacy. e.g., families, close friends) and common identity groups (who are bound by purpose or interest. e.g., project groups, people who like tennis) from group dynamics theory [45].

Previous studies also explored what is shared through account and device sharing [1, 22, 26, 29, 34, 47]. In the case of account sharing for online resources, a study categorized these kinds of accounts into two different categories: accounts designed for sharing (Netflix, Amazon Households, Spotify premium) and accounts not designed for sharing (WhatsApp, Facebook, Instagram, LinkedIn) [29]. They found that accounts not designed for sharing also get shared in practice. This study further categorized the sharing of accounts not designed for sharing into reasonable and unreasonable sharing [29]. According to this study, reasonable sharing is when the terms of services (ToS) are

violated, but the revenue for the account-providing platform is not reduced, and unreasonable sharing is when the ToS is violated, and the revenue is also reduced.

The studies on account sharing identified sharing influencers [26], taxonomy for sharing types [26], taxonomy for sharing reasons [22], and the cognitive and psychological burdens of ending account sharing [29]. They also found that the motivations for sharing are highly influenced by trust in the sharee and convenience [28].

A study specifically focused on how small social groups navigate cybersecurity and privacy (S&P) collaboratively [54]. They developed group threat models and identified group strategies for securing shared resources. Other studies also touched on the aspects related to privacy around account sharing in various capacities [22, 29, 34, 47]. In the context of Bangladesh, a study on digital privacy challenges with shared mobile phone use found that device sharing is deeply embedded in social and cultural practices [1]. Building on this [1] and other related studies on shared mobile phone use in Bangladesh, Ahmed et al. further developed a 'tiered' privacy model and deployed their design in 21 Bangladeshi participants who share mobile phones [2]. Another recent study on privacy perceptions among the pious Muslim community in Bangladesh reported how the Islamic spirit and sacred values generate privacy norms and customs and recommended a new analytical perspective to understand and design privacy-preserving technologies specifically for the Bangladeshi pious Muslim community [38].

These previous works show that many complex factors related to infrastructure, platform, and culture, among others, impact sharing behavior. There is a gap in knowledge on how these behaviors form and what strategies are developed to deal with inadequate infrastructural support, especially in the Global South context. We are particularly interested in understanding the use and sharing of subscription-based services in the presence of infrastructural difficulties in a Global South context, as previous research has not investigated this space.

3.2 Informality and the Role of Intermediaries in the Global South

HCI scholars have highlighted the role of informality, informal marketplaces, and related practices in technology consumption in the Global South [14, 15, 33]. This informality can be defined [28, 41] as "a set of activities that occurs outside the formal regulatory framework." This literature emphasizes that informality manifests flexible strategies for people to avoid economic, social, and political constraints [14, 15]. Through ethnographic accounts from two informal ICT markets (one in Bangalore, India, and the other one in Dhaka, Bangladesh), Chandra et al. focused on the fact that the majority of technology consumption in the Global South happens through informal technology markets and found the role of materiality, relationships, and situated knowledge in those informal marketplaces [15]. Using the lens of practice theory and HCI, they characterized the practices of searching, clientelization, bargaining, and testing as prevalent informal marketplace practices. In a different study, Chandra provided accounts for how the market environment and spatial configurations allow informal operations to remain hidden, drawing from his ethnographic observations along the technology market on SP Road, Bangalore (a popular electronics retail and repair area in Bangalore) [14]. His study also points out how local actors use traditional communication technologies to successfully collaborate and maintain the market. Concerns related to failing to adhere to established institutional rules came out in his discussion, where he drew from the argument of sociologists Cross and Pena [17], which is for, "a differentiation between informal and criminal based on the relationships between regulatory mechanisms and the economic activities [14]." Pal et al. investigated the phenomenon that arose when the Indian Government pushed for cashless transactions and pointed out that, when formal systems fail, communities lean towards informal systems [33]. Rohanifar et al. used the concept of informality in the context of transnational finance [41, 42]. In one study, they documented informal workarounds adopted

by the Iranian migrant community in Canada that allow them to circumvent the challenges of transferring money internationally [41]. They also suggested adopting a postcolonial perspective on informality instead of using the simplistic binaries of formal and informal.

Another set of studies has looked specifically at the role of intermediaries in facilitating access to digital resources in the Global South. For example, Sambasivan et al. investigated the role of intermediated interactions as a prevalent mode of information access in India [44]. From their ethnography in two urban slums in Bangalore, they identified some motivating factors for adopting intermediated interactions, such as fear of technology, lack of textual literacy, numeracy, or digital operation skills, habits of dependency, cost of owning a technology, and access constraints. They also articulate the interaction mechanism in intermediated interaction. In their recent interview study in Dhaka, Bangladesh, to identify challenges in the adoption of cashless transaction systems, Rohanifar et al. mentioned the role of intermediaries in accessing streaming services in Bangladesh [43]. They presented the phenomenon of intermediaries providing streaming services to users as one of the challenges in adopting cashless transactions. Rahman and Rashed et al. utilized this concept of intermediary use in the Global South to design a healthcare service named 'Dakter Bari' for extremely impoverished people [37]. They found that technologically connected intermediaries can close the gap between extremely impoverished people and existing healthcare infrastructure in the global south [37]. Intermediated use was also found in Haque et al.'s study on the tensions between owners and drivers of Uber cars in urban Bangladesh [21]. In this case of intermediated use, the owners of Uber cars and their drivers are different persons, which affects the power and social dynamics between them [21].

From this review, it is apparent that the literature on informality in HCI has mostly focused on physical marketplaces in the Global South. Our study accounts for a similar kind of infrastructure emerging in online spaces for subscription-based and streaming services. We also report on the role of intermediaries for facilitating access to subscription-based services in Bangladesh which has not been explored in detail in previous literature.

3.3 Entertainment Media Sharing in the Global South

A body of literature has investigated mobile media sharing in the Global South [23, 24, 31, 46]. For example, Smyth et al. highlighted mobile media sharing in Bangalore, India, and demonstrated how entertainment as motivation can help to overcome barriers to technology adoption in this context [46]. They presented their findings regarding motivations, innovations, and barriers in mobile entertainment media sharing practices. O'Neill et al. did a study in a similar socio-cultural context of Bangalore to update knowledge of mobile media content creation and sharing, transfer, and privacy and security issues [31]. They compared their findings to those of Smyth et al. to demonstrate what has remained constant and what has changed in mobile media sharing practices. Kumar et al. at an ethnographic study, tried to better understand the production, reproduction, and reception of music in India, and they presented their findings on music's materiality [23]. They discussed how digital mobile media sharing via Bluetooth and memory cards has replaced the previous form of physical exchanges of CDs and DVDs, thereby initiating newer forms of sharing practices. In another study, Kumar et al. investigated pirated mobile media sharing infrastructure in India [24]. Using the actor network theory framework, they showed how the "practice of piracy not only fuels media consumption, but also drives further technology adoption and promotes digital literacy." They argued and considered the role of piracy as a legitimate actor that can bring ICT capability to underserved communities.

These studies mostly focus on mobile media sharing and production in the Global South. In this paper, we focus on the more recent shift to subscription-based services in similar contexts that have not been studied in detail previously. By doing so, we provide an update on online media sharing,

including entertainment media, in the Global South. We argue similar to how the replacement of CDs and DVDs by Bluetooth and memory cards replaced and initiated newer forms of sharing practices, the transition toward subscription-based streaming services from torrent downloads enables new forms of infrastructuring practices.

4 Methodology

We conducted semi-structured remote interviews to understand the nature of participants' online account-sharing activities, their motivations, common practices of coordination- collaboration, and their perceptions about sharing and privacy. Our research protocol was approved by our university's Institutional Review Board (IRB) prior to data collection. We followed their ethical guidelines in participant recruitment, data handling, informed consent, and risk communication.

4.1 Participants

We recruited adult participants who live in Bangladesh and who have experience of using subscription-based services sharing with one or more people at some point in their lives. The first author used his social media and personal network to ask for participation in this study. He posted to Facebook and Instagram and used email for personal contacts. After the first set of participants (n=12) were recruited in this way, the remaining participants were recruited by snowball sampling, during which we asked participants to refer us to other potential people they know who may share accounts online but are not in their account sharing group who might have similar or somewhat different experiences of using subscription-based services. Participants were communicated through the instant messaging tool of the respective social media platforms (Facebook Messenger, Instagram direct message, and WhatsApp) and emails. All the participants confirmed having access to robust Internet connectivity and experience with web conferencing tools to enable remote interview participation.

The study participants were 22 in total, consisting of 15 males and 7 females, aged between 18 to 33. While there are more male than female participants in our study, we strived to recruit both genders. The first author is male, and recruiting using his social network initially may have resulted in more male participants. We chose to recruit young adult participants as they are more likely to use online account-sharing services in our context and to provide an accurate picture of current practices. All participants live in the urban areas (capital city Dhaka, the second largest city Chattogram, and another divisional city Rajshahi) of Bangladesh and are mostly students and young professionals. Table 1 provides the participants' demographic information.

4.2 Data collection and analysis

We conducted semi-structured remote interviews over a period of six months (January to July 2022). We chose to conduct remote interviews primarily because of convenience, as the first author was in the US at the time of the study. The interviews lasted between 35 minutes to one hour, and each participant received compensation equivalent to 10 USD for their time in the form of a gift card or mobile money transfer of their choice. An interview protocol was used to guide the conversation (please see the Appendix), and all interviews were conducted by the first author using web conferencing platforms, including Zoom, Webex, and Google Meet. We asked participants questions about the online platforms they use, how they access them, and who they share them with (if anyone). Sample questions included, "How do you get access to the paid platforms (how do you pay; do you face any difficulty)?" and "Who do you share each account with?" The first author is from Bangladesh and is proficient in spoken and written Bengali and English. All the interviews were conducted in Bengali and audio recorded with the permission of the participants. We stopped

Table 1. Participants' Demographic Information

Participant no	Age	Gender	Occupation
P1	23	Female	Student (3rd-year, Undergraduate, Law)
P2	23	Male	Student (3rd-year, Undergraduate, Law)
P3	24	Male	Student (4th-year, Undergraduate, Industrial and Production Engineering)
P4	25	Male	Bank employee
P5	22	Female	Student (2nd year, Undergraduate, Urban and Regional Planning)
P6	27	Male	Quality Control Manager
P7	23	Male	Student (4th-year, Undergraduate, Electrical and Electronic Engineering)
P8	23	Male	Student (4th-year, Undergraduate, Electrical and Electronic Engineering)
P9	21	Male	Growth team executive at a publication firm
P10	26	Female	Fintech (Financial technology) company employee
P11	24	Male	Student (4th-year, Undergraduate, Chemical Engineering)
P12	27	Female	Intern Doctor
P13	19	Male	University admissions candidate
P14	22	Female	Student (2nd-year, Undergraduate, Law)
P15	27	Male	Economic graduate, Govt. job candidate
P16	27	Female	Junior Architect
P17	18	Female	Higher Secondary Candidate
P18	26	Male	Software Engineer
P19	25	Male	Community Architect
P20	23	Male	Student (4th-year, Undergraduate, Bachelor of Medicine Bachelor of Surgery)
P21	33	Male	Growth Marketer at an electronics company
P22	23	Male	Technology manufacturing company employee

data collection when we reached the theoretical saturation and started seeing repeated themes in our data.

The recorded interviews were then transcribed and translated into English by the first author for analysis. We used an inductive thematic analysis approach to analyze the data [9, 10]. This method allowed us to construct themes from patterns identified in the data. We engaged with the six phases of thematic analysis, including familiarizing ourselves with the data, generating codes, generating initial themes, reviewing themes, defining and naming the themes, and writing them up for the current chapter The first author led the analysis, and the second and third authors helped review, refine, and define themes for inclusion in this chapter. We used an iterative process of discussion and feedback to ensure the credibility and validity of our analysis.

5 Findings

5.1 The Shift Towards Online Subscription-based Services in Bangladesh

With the widespread adoption of digital cloud-based technologies, online subscription-based services have become increasingly popular in Bangladesh. According to our participants, the period

of lockdown due to the COVID-19 pandemic in 2020 further accelerated this adoption. Participants provided a detailed description of the current state of the commonly used and adopted subscription-based services in Bangladesh and how they experienced the shift in accessing digital media through physical media, such as DVDs and USB drives, and peer-to-peer platforms (i.e., torrent), to subscription-based online services.

5.1.1   What Subscription-based Services Are Used and Why. Participants shared their experiences of using and sharing accounts on various international and local platforms. Our participants expressed the motivation for using these subscription-based services as accessing entertainment, education, and skill development. Some of their most used international streaming services included Netflix, Amazon Prime Video, Disney Plus, Spotify, and Hulu. Other platforms mentioned by the participants were related to skill development, writing assistance, or education, such as Grammarly, Canva Pro, Quillbot, Turnitin, Scribd, Coursera, Chegg, and Microsoft Office. Additionally, some participants mentioned platforms that operate mostly locally, like Chorki (Bangladeshi streaming service), Hoichoi (Bengali streaming service), and Ten Minutes School (educational app). For accessing international platforms, participants pointed out several difficulties, among which we found the unavailability of feasible payment methods as the most common and enduring. We elaborate on this difficulty in 5.2.

Due to the payment difficulties, participants find workarounds to get access to international subscription-based services through intermediaries. While some of the participants (n=4) used their own accounts at the time of the study, most of the participants (n=19) mentioned getting access to these services from social media pages or from friends or relatives who live abroad (i.e., intermediaries) at least once or twice in the past. We will describe these methods of getting access to subscription-based services in 5.3 in detail.

As participants have to rely on sharing and intermediaries to access their desired services, in some cases, it becomes challenging to get access to platforms that are less popular. For example, P2 described that he was interested in using Curiosity Stream but faced a challenge to find people to share with:

> "I have used Netflix, also Amazon Prime- both in sharing. I have used both for one month each. Currently, I am interested in using the Curiosity Stream. I am looking for people who would be interested to share an account with me."

He further elaborated that a challenge was that, given CuriosityStream's particular focus on documentary movies, he found it challenging to find friends who shared the same interests. The same happens to the platforms which have a small user pool in Bangladesh, like those related to professional skills and software learning tools. Thus, although participants find workarounds to access the services they need, the informal system that is in existence can't support the needs of all users.

5.1.2   Previous Practices and Factors Leading to the Shift Towards Online Subscription-based Services.
Before subscription-based services became popular, people accessed content through various means, such as peer-sharing (e.g., torrent) platforms, pirated software, and offline and online sharing of downloaded files. Participants mentioned that their reason for shifting their use towards subscription-based services was the convenience of use, access to content on the go, increased difficulty of downloading copyrighted content and a desire to stay up to date with recent trends. For instance, P1, who used to download content through torrents, found it a hassle as it took time and required finding and setting up the correct torrents, as well as the time and effort required for "seeding" the torrents. Here, by "seeding" we refer to the practice of distributing the downloaded torrent files to other people by leaving the client account open so the file is available to others.

In contrast, Netflix streams were available to users immediately. She further elaborated how she learned about streaming services from a friend:

> "A friend of mine was talking about getting a Netflix account and asked us if we wanted to share. Before that, I had no idea about Netflix, and I was already using torrents for years. But torrenting is a hassle, and I thought, 'let's give it a try.' Netflix's content is always available. Streaming is smooth, and [pose] no hassle when downloading content. Thinking about all these, I decided to start using Netflix."

Similarly, P6 mentioned that given that Western copyright laws are not enforced in Bangladesh, using pirated software has been common, and it is challenging to find people who are willing to pay for software. P6 described that in their experience, most people often used torrent sites to download software or asked a friend who might have a cracked version of the software to share it with them. However, P6 acknowledged that this informal method of getting software has the potential to carry harmful viruses. P6 also described that sharing movies and TV shows through USB drives (i.e., pen drives) or online Google Drive was common in their undergraduate years (2014-2018):

> "You know, we are used to pirated software. I guess I had a version of Microsoft Office installed on my laptop when I purchased it. That was not an updated version, but I didn't have many issues using it. Also, if needed, I used to download software like that [i.e., Microsoft Office] from torrent sites, or ask a friend who might have the cracked software already. I heard this cracked software has the potential to carry harmful computer viruses too. So, these might not always be safe, but you know, sometimes we need to use software like those."

He also added, "during the first and second year of my undergraduate years (2014-2015), we used to share movies in pen drives. Someone may have downloaded a lot of movies, and we all used to give him a pen drive to get movies (by copying them). After that when the Internet speed got faster, Google Drive sharing became more common. I remember a senior of ours used to share new episodes of popular shows on Google Drive when they just got released." P22 shared that in Bangladesh, the concept of buying or paying for intellectual property was rare, especially for foreign content that cannot be accessed through official channels in Bangladesh, and pirated products are widely available. In his view, the situation is changing gradually, but it is still a common practice. P4 mentioned that before using streaming services, torrent sites were the main source of movies and TV shows, and for him, streaming sites felt like premium services. P5 also mentioned downloading content from the Internet or streaming it from free websites that showed ads with every click. However, with Netflix, there was no need to download and no ads, and they could pick up a movie or series where they left off previously. She found this convenient and "posh". In her words:

> "Before using Netflix, I used to watch content like movies or series by downloading from the Internet. . . . Also, some streaming sites (not official distributors or licensed platforms) are there on the internet for movies, but they show ads with every click. On Netflix, you know, no need to download, no ads, I can pick up a movie or series where I dropped it in the previous time - that's why it felt convenient. And also, it felt kind of posh that time, that's why."

We found that there is a shift towards using subscription-based services rather than older methods, such as sharing torrents. This may indicate that while the use of torrents and other similar mechanisms have not disappeared, they are becoming less prominent than subscription-based account sharing. Another key factor mentioned by all participants as motivation for using subscription-based services was the consequence of the COVID-19 pandemic. According to the

participants, the COVID-19 pandemic also played a significant role in the adoption of streaming services among the participants, particularly during the lockdown period. While some participants had already started using streaming services before the pandemic, many recognized that their consumption somewhat increased or was influenced during that time. P5 noted, "I started using Netflix before the COVID situation, but it is true that from COVID time, I got kind of dependent on these services." During the lockdown period, the use of streaming services increased due to the availability of more free time and limited in-person options for entertainment. P6 mentioned, "[COVID-19 time] actually influenced [my online media consumption] a lot. We got familiar with using different kinds of online tools at this time. Also, at the beginning, we all were staying at home, so getting streaming services became popular." Furthermore, as the demand for subscription-based services increased in the pandemic, it triggered the emergence of different informal and formal ways of accessing and sharing entertainment content. P12 shared:

> "I was living in a hostel. I had a roommate who had an account on Netflix, she shared it with me. I didn't have to pay as she was my friend. Her account payment was made by her father. Her father had Dual currency or Credit card. I left the hostel, and my communication ceased with my roommate. During the COVID-19 lockdown, I started finding a lot of advertisements for Netflix account subscriptions on Facebook. I found a service where 6/8 people share an account, at a very low price. It was auto-renewal based, so I started using that."

Similarly, P13 reflected:

> "I used to know [before COVID] about Netflix that some of my friends had access to. But when the lockdown for COVID started, it got a boost. I remember almost everyone around me kind of started having a Netflix account at that time! I didn't make an account at first, but after one or one and a half months passed, I felt it might be good to have some entertainment."

Notably, the pandemic also prompted collaborative ways of accessing educational resources. Participant P17 shared:

> "For the first time I purchased an online course, it was during the COVID lockdown time... Then we created a separate email address and password for purchasing the course. The email ID and password were something common that we could remember, and the three of us had access to that. In this way, it was cheaper than purchasing the course individually."

However, some participants noted that the economic impact of the pandemic led to some people unsubscribing to these services to save money. P4 commented, "[Before the pandemic,] Netflix users increased, but then again, the pandemic hit us economically, and a lot of people unsubscribed a few months later to save money."

5.2 Obstacles for Accessing International Subscription-based Platforms

As described above, most participants desired to access popular international platforms, such as Netflix, which require paying for subscriptions with foreign currency (i.e., USD or Euros). However, most users face difficulty in making international payments from Bangladesh. The most common problem is the unavailability of dual currency debit, credit, or prepaid cards and the requirement to endorse USD in their passport by going to the banks physically to load money into their account, which participants described as time-consuming and inconvenient. This process of endorsing foreign currency is due to a regulation by Bangladesh Bank for endorsing foreign currency amounts in the passport to be spent on online transactions and foreign travel [31]. Obtaining a dual currency

card is challenging for many, especially students who do not have passports or have limited knowledge of international payment procedures. This, combined with the unavailability of original software and issues of affordability due to the relatively high cost of international subscriptions for Bangladeshi uses, also posed challenges to accessing subscription-based platforms from Bangladesh.

For example, P1 described the challenge of not having access to international payment options: "All of us had bank accounts at Dutch Bangla Bank, but Netflix doesn't support Nexus Card (a card offered by Dutch Bangla Bank). So, we always had to go to a third party (e.g., pirated accounts accessed through social media pages) for payment." P1 stated that this is a common problem, particularly for young students who often lack the necessary documentation or funds to obtain dual currency cards or perform international transactions. This lack of access to official accounts sometimes caused issues for participants. For example, P1 said, "During the lockdown, I took and completed a course on Coursera, but I still have not been able to get the certificate because you have to pay via PayPal or some other payment method which is unavailable in Bangladesh."

Another participant, P6 explained why they prefer to use bKash [8], a widely available mobile banking service in Bangladesh, stating, "Transactions with mobile banking like bKash are much easier, I just have to pay the account owner. That's convenient for me." bKash is similar to other services more prevalent in the Global North, such as Zelle or PayPal, that were not available in Bangladesh at the time of the study. P11 talked about the multiple levels of inconvenience associated with doing international transactions, "The main issue is the payment method. You know, we as a university student, cash is available to us. At first, bKash was not available to us as we needed a NID (National ID card) for that. After getting NID, we all have bKash. But we don't usually have access to international payment. The use of cards is not very common for us. Also, the card has to have the dual currency option open, and some dollar amount should be endorsed against our passports. It's a lot of work. If I had a better alternative like bKash for Netflix, I would have gone for buying the account myself. Not going through any third party." He further added, "Even after having a card, going to the bank to endorse dollars is a pain- you have to take your passport to the bank and everything. Not going through all these hassles, bKash is more convenient for us." Another participant, P18, was describing how he wanted to open Netflix account himself at first, but then came to know about the procedural difficulties which later caused him to acquire the account from a social media page. In his words,

> "Actually, I wanted to create an account or subscribe to Netflix by myself first. But the obstacle I faced was, I had to have a passport, bank account and a dual currency card or something to do international transactions. Then you have to endorse dollars at the passport to enable international transactions. There is no easy solution, you have to go through this process. So, at that time I saw some ads at Facebook, who are selling Netflix accounts- most probably FB showed it to me because I was searching for Netflix at Google. So I knocked one of them, they told me to bKash them the money and then I got the account."

Similarly, P19 shared, he switched from using an account from a social media page to having his own account and paying for it by himself but again went back to using an account from the social media page due to the unavailability and inconvenience of currency conversion:

> "At first, I had a Netflix account from a third party page. Then I opened my own account using a dual currency card. I have this dual currency card to shop or pay. But the problem is that very few branches of the bank actually offer the BDT to USD conversion services. Whenever I have to pay through my card in USD I have to travel a distance to a large scale branch and deposit the money. So it's not like I always have

> USD on my card but Netflix requires payment every month. It was a bit of a hassle, so I returned to subscription through a third party."

These challenges encouraged participants to find alternative ways to access international platforms and products, including sharing accounts with others who have access to international payments or going through third-party payment providers. For example, P9 stated, "Rather than opening an account and paying for it by myself, I preferred to share the account, where someone else makes the payment. That's a lot hassle-free for me as Netflix payment has to be done by a dual currency card or something." These findings highlight the importance of having payment options that are accessible and convenient for individuals in Bangladesh.

5.3 Strategies to Overcome Obstacles to Accessing Online Subscription-based Services

Participants described several strategies for overcoming obstacles for accessing subscription-based services, including buying subscriptions from social media groups, sharing accounts of relatives and friends, using local re-streaming platforms, and receiving access through hacker and student activist groups, that we will present in this section.

5.3.1 Accessing Subscriptions and Online Media through Local Social Media Pages and Groups, and Streaming Services. The most common practice we found among our participants (n=19) to access international subscription-based services was the use of social media pages and groups selling subscriptions. Participants mentioned a number of social media pages and groups (mostly on Facebook and WhatsApp) that sell account information for international online subscription-based services. Our participants described the organizer of these groups as "admin," "service provider," or "agent" who would create and manage the social media group or page. Participants described how group admins would use the possibilities already built into the platforms to provide access. For example, the admin would buy a premium Netflix account which can be shared among five individuals. Then they would sell that account in local currency to five people who they advertise and identify using their social media pages and groups. The participants described that the admins usually advertise different kinds of services and access options on their pages and groups. For example, they would sell one premium account to a group of five friends, or they would sell those five profiles under one account to five unrelated individuals who would contact the organizers through their social media page or group and then get connected together by the admin. The users who did not know each other previously would only communicate with the admin or their contact person to make payments at the end of the month. These third-party admins would receive payments through local mobile banking services, which is very common in Bangladesh.

Participants described that to find a trustworthy admin, users would look at their online reviews, Facebook likes, public comments on their pages or groups, the way they respond to public messages and private communication, the amount of money they ask for, their ability for them using Bengali keywords (to make sure they are local), and recommendations from friends. For example, P7 found an account on WhatsApp through a friend who added them to a group that provided Netflix account access for a monthly fee. After using the account for a month, P7 felt that the amount of money they were charging was high and searched for other options. P7 used keywords such as "160 taka (about USD 1.5) Netflix" (searched in Bengali) or "Netflix subscription at a low price" (searched in English) on Facebook and found a profile that sold Netflix accounts at a low price. P7 was satisfied with the admin's replies to their inquiries and took an account from them. P9 and P11 stated that they searched on Facebook using Bengali keywords to limit the results to pages from Bangladesh. They looked at the reviews and other engagement indicators like the number of subscribers or followers, how they replied to comments and inquiries, and customer feedback to make a decision about which page to rely on. P9's described:

> "I use the search tool on the Facebook website. I used to search using Bengali so that only the pages from Bangladesh came forward. Also, the Facebook algorithm shows ads related to my search or interest, so I get page or post suggestions from Facebook too. I also look at the reviews and [indications of engagement such as] like numbers, how they reply to [public] comments and also how they reply if I ask something in inbox [via private message]. These are some of my strategies. I haven't faced any issues like fraud yet."

These pages offer different kinds of packages based on the price and characteristics of the subscription. For example, two common types of subscription packages are "non-renewable" and "renewable" accounts. Non-renewable accounts expire after a set period of usage time (usually one month). If the subscriber wants to continue, he or she would get a new account. Participants guessed that these accounts might have been created taking advantage of the trial periods offered by subscription-based platforms, which was further evidenced by some of them being called "trial IDs." With non-renewable packages, the subscriber would not be able to preserve his or her watchlist or personalized feed when transitioning to another account. On the other hand, renewable accounts are paid for and "renewed" monthly. This package usually costs more, but the watchlist or personalization of the account remains. Social network admins also sell individual profiles within one account. For example, they could sell and distribute a Netflix premium account to five different subscribers who might not know each other. Another service for people who already have subscription-based accounts but do not have access to an international payment method would only involve paying for their subscription on their behalf.

Participants expressed some concerns about using these social media pages and groups to purchase international subscription-based services. Participants sometimes had reservations about sharing their watch history with strangers or leaving their personal information and contents in a shared account. Despite this concern, they generally accepted this as a limitation of accessing services using this method. Additionally, developing a good relationship with the admin over time is important to ensure that the service is reliable and consistent, as expressed by the participants. Some participants reported incidents of dissatisfaction with the admins because of not delivering promised service, unrecognized activities in the account, or unexpected account blockage and restriction. Participants suspected unrecognized activities when they noticed contents they didn't browse or watch in the watch history or included in the watching list in their account. The platforms also often have mechanisms to restrict too many people from accessing one account, so if something like this happened, participants sometimes saw their account blocked by the platforms. In cases like this, participants contacted the admins. The admins usually gave them another account, but sometimes our participants informed us that they either didn't get any response or the admin refused to take responsibility. In these cases, the participants had to change their provider.

Another way a few participants (n=4) access a wide variety of content is through local informal streaming websites that download and compile content from different international platforms and stream them from their servers. These websites sell subscriptions to their own local service, offering a cheaper alternative to international streaming platforms. One participant, P4 shared his experience with a Bangladeshi streaming service provider called "Oneflix", that they described as an "independent streaming service." They described the tradeoffs of using this service as: "The benefit is they have all the contents from all the streaming sites such as Netflix, Hulu, Amazon etc. [However,] streaming service might be a bit slow but it's cheaper." He further described that on this platform, the content was available at all times, as opposed to other streaming services that restrict streaming times of specific content due to copyright laws. Furthermore, he could directly request content to be added, which would be done within a day. He found the service to be a cost-effective

alternative, especially as they could access all the content without needing to use a VPN (Virtual Private Network). On the other hand, the participant did acknowledge that this streaming service was not as user-friendly as Netflix, and sometimes the service could be slow if bandwidth was low. However, he found it useful to use both services in parallel, as it provided him with more options and made him feel more confident about having reliable access to content.

Another similar local service was described by P13, who mentioned that his internet service provider (ISP) had a File Transfer Protocol (FTP) server with many contents available for download. He also shared that the ISPs do not usually charge any extra fees for giving access to these servers. For browsing those servers, they must be getting internet services from that ISP, usually in the form of broadband connection.

These examples indicate that accessing content through local sources can be a popular way of bypassing the limited availability of international streaming services but that they are not as widespread as buying shared subscriptions from social media admins.

5.3.2 Accessing Subscriptions and Online Media through Friends, Family, and Social Groups. Participants described several practices where they would share accounts with friends, family members, or university peers. This was often when a friend of family member lived abroad and, therefore, had access to international payment methods. In this case, the sharing of cost depended on the nature of the relationship. For example, in some cases users in Bangladesh did not pay for the subscription and their friend or family abroad would cover all costs. In other cases, a user from Bangladesh would pay his/her share of the subscription fees indirectly by paying someone closely related (close family member, partner) to the account owner who lives in Bangladesh. For example, P6, talked about his experience with taking an online Microsoft Office subscription with a friend who lives in Germany:

> "A friend of mine who lives in Germany, once told some of our friends that he is taking a Microsoft Office subscription and if we are interested, we can take a family plan or something like that together. So, four of us took that subscription together. Among them, three of us were in Bangladesh and that friend of ours who is in Germany made the payment and all. We paid our share to his brother in Bangladesh through bKash."

This indirect method of payment was used because sending money abroad is a difficult process in Bangladesh.

Our findings also showed that users in Bangladesh who have access to international payment methods usually create their own accounts and share them with friends and family members. These small groups would split up the subscription fee and pay the account owner in local currency. In some cases, the person who makes the payment may not be the active user of the account, but they have access to international payments to make the payment, and by doing so, help their friends get access to the services they want. For example, P7 shared that:

> "I think it was April 2020, when the COVID lockdown started. A friend of mine asked me whether I wanted to share a Netflix account with them. They were opening a Netflix account with the help of a senior brother who had a MasterCard. I agreed to share an account with them."

Similarly, P6 mentioned a scenario where he and his friends convinced an acquaintance to share an account with them:

> "Then I heard, a senior 'apu' (elder sister, not always blood-related) whom we know, was thinking of getting a Netflix subscription. She had a credit card, so she wanted to buy the account herself. So, some of my friends and I, convinced her to take a premium account which can be shared among five or six people. By doing that, she might not

have any advantage [to not sharing the account], but we can have access to Netflix. She was kind enough to buy a premium account and share that with us. We contributed our share of the subscription fee. So, it was much easier to pay her directly."

Finally, our participants described another interesting way to get access to shared subscription-based platform accounts. Several participants (n=5) informed us that students from the same institution or discipline form social media groups and communities to share resources with other students (mostly) for free. These groups sometimes buy subscriptions collectively or manage login information from different sources and share among themselves, which enables everyone in the group to use them when needed. Participants shared that the motivations behind this sharing of accounts and resources are for marketing (for the group), helping each other, networking, and getting free access to subscription-based services.

The participants also mentioned social media groups that call themselves "ethical hackers" who provide free accounts from different subscription platforms.

However, using an account that is accessed by a lot of people has its issues. Anyone can access other person's works, watch history, etc. Additionally, anyone can change the password, and the account may not last long as it is temporary. To safeguard against these issues, group members and admins take measures such as not leaving personal content on those accounts by deleting their work from the platforms and using applications that prevent the platform from detecting multiple uses. By personal content, they meant their CV or resume, class assignment, their authored academic papers, and posters.

5.4 Social Motivations and Dynamics Among Subscription-based Services Account Sharees

Our participants revealed several aspects related to the social motivations for their sharing behavior and collaboration and coordination dynamics of using the same account with each other in an informal setting.

Participants reported that they were motivated to help their friends with resources. They expressed a desire to help others by making international payments, posting on social media to find partners for sharing accounts, purchasing online courses, coordinating sharing, and forming groups to subscribe to a platform. Friends were invited to join sharing groups, and people also found sharing partners through mutual acquaintances. For example, P22, who has access to international payment and helped a number of people (well-known and little-known to him) to get access to various international platforms, noted,

"Other than streaming platforms, I provided people with subscriptions to some other platforms, some of them were educational like I remember I gave Chegg (a subscription-based platform for providing homework help, textbook rentals, online tutoring, and other student services) accounts, there are some other platforms where they practice IELTS (International English Language Testing System) and GRE (Graduate Record Examinations), [or platforms like] Goodreads. Actually, in these cases, I just made payment for someone when they asked for it... my motivation was to help people. I saw my friends needed a subscription for IELTS or GRE preparation or needed to make a payment for a publication. I felt how important those are to them, so I wanted to help in these cases as far as I can."

In another instance, P7 talked about a case when he was looking for a subscription to a particular platform and how he managed to get that from an acquaintance who was willing to help:

"Once, I needed to write an academic paper. For that, I needed to check my paper with plagiarism detection software. Turnitin was [a platform] like that. It is mainly used

by teachers or faculty members. It's a bit difficult to ask for account access from them frequently. So, I was looking for some other way. I knocked some of the seniors who might have an account. Then I got it from a senior who actually knew me quite well. He provided the login ID and password just like that and told me I don't need to pay any fees. I didn't want to use it for free, so I insisted. Then finally he took a negligible amount from me for one month's use."

P17 was also talking about an instance when she got access to an online course from a friend who had already finished the course. She was describing it as a very common practice to them:

> "Another shared online course I have used was from a very close friend of mine who was preparing for the medical admission exam, and she had an online course on premedical preparation. She had finished the course by that time, and I needed to look into some parts of that course, so she shared the access with me for some time. It's very common in our practice."

So, motivations like helping each other, maintaining social relationships, and shared responsibility play crucial roles in our participant's sharing decisions.

Participants reported a preference for sharing accounts with friends rather than family members or unknown people. For example, P1 said, "The account I shared with my friends. Because the email ID was ours, so I felt more secure. So, there was no chance of fraud. And whenever some other device tried to access our account, we would know as we had access to email notifications. But in the case of a service provider, we would not even know if someone attempted to log in." Concerns were expressed about sharing among family members compared to friends due to cultural and generational differences. Specifically, participants did not want their family members to see all their watch or browsing history on the account. Regarding sharing with unknown people, which usually happens in cases of accounts from social media pages, participants haven't shared any major concerns about discomfort, privacy, or security. Some participants (n=3) even expressed their preference for sharing an account with unknown people. For example, P7 said he feels more comfortable sharing an account with unknown people because they may not judge. In his words, "It actually feels more comfortable to use an account with people I don't know. People who know me personally may judge me, but that is not the case for people who don't know me." Participants shared that the only thing that other sharees may access in streaming platforms can be the watch history. They felt that watch history was harmless for other sharees.

In the case of accounts with multiple users, platforms have a feature of setting up Personal Identification Numbers (PIN) for each individual profile. As reported by the participants, in the case of the accounts received from social media pages, the admin sometimes sets the PIN for each profile; sometimes they don't. Participants reported varying attitudes towards using PINs as a securing feature. Some [n=9] perceived it as a good way to secure their profile, while some others did not care about using it. For example, P4 was saying he doesn't use PIN:

> "I was not concerned whether a stranger could see what I was watching. Even now when I am sharing account with 3 other friends I don't use PIN, it takes a minute extra to get to the content. And I am not concerned if my friends can see what I am watching. I don't think they have that much time to stalk me."

Participants expressed concerns about leaving their own work in shared accounts and the importance of individual profiles. Participants also reported concerns about their watch history being accessed by others and leaving personal content in shared accounts. However, some reported that privacy or personalization was not an issue among close friends. Personalization was hampered in sharing an individual profile, and some reported that personalization was not a concern for

infrequent users. Participants also mentioned clearing the watch history before account discontinuation and deleting their personal work every time after using the account as privacy safeguarding practices.

In terms of coordinating shared use, participants reported communication among sharees, decision-making about how to use resources from the subscription, distribution of individual profiles, and distribution of payment among sharees. Participants shared that collaboration and coordination were important among users and with the admin. Participants also expressed that there were ups and downs in relationships among sharees, which sometimes made sharing awkward. For example, P12 stated,

> "When I was using my friends' account, sometimes, you know, it happens that there are ups and downs in relationship with friends. So, it becomes awkward using their Netflix. But now it's my account, I don't feel any concern about privacy now even though I am sharing accounts with strangers. As there is PIN for every profile. Also, I don't think anyone else other than the two people I shared the PIN with has any access to my profile."

The participants shared that screen time limits imposed by some platforms were a common problem, which could lead to inconvenience and disruption in streaming. As shown above, participants discussed sharing behavior, including sharing account access with colleagues, sharing individual profiles, and temporary sharing among friends.

5.5 Perspectives on Informally Using Online Subscription-based Accounts

Participants expressed a preference for accessing their accounts through official channels. They believed that official channels were more reliable, secure, and legitimate compared to alternative sources. However, they acknowledged that third-party pages provided a way for them to access accounts that might be otherwise difficult to create independently. Nevertheless, this avenue raised ethical concerns regarding the credibility of these sources and the methods used to generate the accounts.

Participants found it easier to access local platforms compared to international platforms. This was due to the ease of payment methods and a feeling of responsibility to support local platforms. The feeling of responsibility to support local platforms mostly came from a sense of patriotism. They expressed a need to support local platforms as they may potentially benefit local artists and local content. However, participants also recognized that the content library of local platforms is not as rich as that of international platforms.

Despite the convenience of these alternative sources, ethical reservations surfaced among participants regarding their usage. Specifically, participants questioned the legitimacy and ethics of obtaining accounts from third-party pages. For example, P14 highlighted, "I have doubts whether these accounts are created in a proper way, I mean whether they are authentic or not. I don't have any problem with them taking my money and giving me accounts which I couldn't get otherwise, in fact they are providing me with a great resource. But I heard that sometimes they create accounts with fake credit card information or something. I am not sure Netflix is always getting some part of my money. I want that because Netflix is producing the content, actually. Other than that, I don't have any security or privacy concerns."

Participant P10 echoed the sentiment, "Actually if there was not this problem of credit card, I would have opened my own account a long time ago. I would have then found my own partners." Here by saying "this problem of credit card", the participant meant the obstacles we described for currency conversion and international payment in section 5.2.

The convenience of payment methods played a crucial role in deciding which platforms to access. P9 expressed how they subscribed to a local service (Hoichoi) through the official channel and to Netflix using an account purchased from a Facebook account:

> "The only reason is that Hoichoi has a system of paying through bKash in Bangladeshi taka, which is very convenient for me. For Netflix, I have to do international payment. If Netflix had the option to pay by bKash or other convenient methods at a reasonable price, I would have subscribed to them by myself [rather than through an admin]."

In an overall sense, participants exhibited a preference for official channels due to their perceived reliability and legitimacy, despite the convenience offered by alternative sources, particularly for accessing international platforms.

5.6 Perspectives on Future Equitable Platform Practices

Participants shared their perspectives on what platforms can do to follow more equitable and inclusive practices, including expanding payment methods, revising sharing policies, and expanding content availability.

Most prominently, participants wanted streaming platforms to make their payment process easier for users in Bangladesh. As mentioned before, they described issues with complicated payment procedures and expressed a need for more streamlined payment options, pointing to the need for platforms to prioritize simplifying the payment process to improve user experience.

Participants also voiced their opinions on how subscription-based platforms can make their policies more equitable. For example, in reference to Netflix's written, but often not enforced, policy that states account sharing should only be done by members living in the same household [30], they indicated that platforms should not dictate with whom account holders can share their accounts. For example, according to P2, if an account is for multiple people, it should not matter whom they decide to share it with:

> "If an account is meant to be for four people, I think the users should decide with whom they want to share that account. Whether they live close or far shouldn't matter."

However, participants agreed that platforms should limit the number of users who can access an account. For example, P3 expressed a similar opinion about user's right to share an account with whomever they want and recognized that platforms should limit the number of users:

> "I think if an account is sold to be used by four or five people, the users should have the say on with whom or how they want to share the account. If they use more than five people, in that case, the platform can restrict that."

Additionally, participants expressed that the content library should be the same across all regions and that streaming platforms should not differentiate content based on geographic location. For example, P15 was sharing his opinion that, he doesn't like Netflix's content library to be different in different countries: "One thing I noticed is Netflix restricts some content depending on the country. For example, my sister, who is in the USA, can see some content, but I cannot because I am in Bangladesh, even if we are sharing the same account. This policy of Netflix I don't like. I feel like it should be open."

Similarly, P22 voiced the same opinion about the difference in content library for different regions. He mentioned that he sometimes had to use a VPN to access content not available in Bangladesh. In his opinion, the price difference is not proportional to the difference in content library:

> "There is a huge difference in content libraries region-wise. For our region, the contents are very limited, narrow. I sometimes used VPN, which I don't use now but when I used to set my location in the UK or USA, there was a lot of contents, which we

can't access from our region. The subscription fee is lower here but if we compare the price difference, the content library difference is not proportional. I don't think this difference in the content library should exist."

In summary, participants valued the ability to share their accounts with others but also expected limitations to be put in place to ensure fair use and that they desire equal access to content regardless of location.

6 Discussion

Our findings shed light on the intricate dynamics surrounding the adoption of online subscription-based services in Bangladesh. The participants' perspectives, desires, and challenges provide several valuable insights into the evolving landscape of digital content consumption and digital technology infrastructure in the context of the Global South. In the following sections, we describe how our findings reveal current updates on the nature of entertainment media sharing in the Global South, the characteristics of online informal marketplaces and intermediated practices that emerged in the context, and the potential takeaways for the HCI community based on the participant's perception on using alternative methods and their opinions on policies of the platforms.

6.1 Adoption of Subscription-Based Services for Sharing Entertainment Media in the Global South

Our findings provide a view of the shift towards online media sharing in the Global South that is similar but distinct from those happening in the Global North. In this shift, young consumers of online digital content in Bangladesh share the desire for high-quality, easy-to-access, and up-to-date services of their Global North counterparts but have to deal with inequitable obstacles dictated by their geopolitical distance from the Global North. This geopolitical distance has already been characterized by HCI scholars as terrorist assemblage, a factor for negatively influencing the adoption of cashless transactions in the Global South [43]. Rohanifar et al. reported that, due to the hyper-alarmed scrutinization practices in the financial sector after the 9/11 terrorist attacks in the US, users from countries like Bangladesh often face difficulties doing international transactions [43]. Our findings demonstrate how barriers to cashless transactions also impact and transform the adoption of entertainment media sharing in this context.

Previous literature on online media sharing in the Global South [23, 24, 31, 46] highlighted the use, adoption, and motivation of mobile media sharing and the infrastructure of music production and sharing. They have shown how the practice of piracy is prevalent in this context, and it not only fuels media consumption but also drives further technology adoption and promotes digital literacy [24]. They have also shown the shift from CD-DVD to Bluetooth and memory cards initiated newer forms of sharing practices [23].

Our study advances this body of work and provides a detailed account of how the shift towards subscription-based services from previous practices like downloading torrents [36], sharing pirated software, and online and offline sharing of downloaded content initiated newer forms of sharing practices and interactions like the formation of social media pages dedicated to selling account logins, and innovative ways of sharing, collaborating, and coordinating for sharing accounts among each other.

While we found our findings consistent with previous scholarship, we also found differences due to the mode of entertainment consumption and the driving factors that gives rise to the new practices. For example, our findings are consistent with Smyth et al.'s demonstration [46] that entertainment as motivation can help to overcome barriers to technology adoption in the Global South. We found the same motivation for entertainment as the driving factor, but the obstacle

of payment difficulty due to the geopolitical distance came out as the new challenge. While the previously studied shift from CDs and DVDs to Bluetooth and memory cards was largely confined to co-located interactions and exchange among the users [23], the shift studied in our study is largely done in a remote fashion utilizing social media communication, online drives, and servers. Our findings also find the practice of piracy like previous literature, but this also took the form of subscription-based services that we have noticed from the example of "Oneflix" and FTP servers.

During most of our participants' responses and the experiences they shared involved entertainment services, participants reported using other non-entertainment services, such as Grammarly, Canva Pro, Coursera, and Microsoft Office indicating that the use of non-entertainment subscription-based services is also prevalent in the country. In our data, we found participants faced similar or even more challenges accessing services other than entertainment platforms. Thus, we expect the infrastructural challenges that participants reported to be similar across different kinds of subscription-based services, including news, educational, and skill development platforms.

These findings motivate us to probe deeper into the differences and similarities in user motivations when using different types of online platforms.

6.2 Informality and Online Marketplaces, Intermediated Use, and Infrastructure

In our findings, we described the practices and dynamics of online informal marketplaces for accessing subscription-based services in Bangladesh, which emerged mostly due to the difficulty in payment processes. This advances previous HCI works on informality, informal marketplaces, and the role of intermediaries in the context of the Global South. The previous research on informality in HCI has mostly focused on traditional technologies in physical marketplaces and transnational finance [14, 15, 33, 41]. Our study reveals the emergence of a similar kind of informal marketplace in online spaces due to different resource constraints and inequities. Although similar in practice, we found some distinct characteristics of these online informal marketplaces.

Chandra et al.'s previous articulation of informal marketplaces delved into two aspects: informal market practices analyzed using practice theory [15] and the role of traditional technologies as tools for collaboration [14]. The practice theory used by Chandra et al. outlined four practices at informal marketplaces- the practice of searching, the practice of clientelization, the practice of bargaining, and the practice of testing. While we found all these practices in online marketplaces for subscription-based services in Bangladesh, they were not facilitated by a locally and historically situated marketplace like SP road of Bangalore, or underground market of Dhaka. The primary characteristic of the marketplace for online subscription-based services is that it is facilitated by social media platforms and the interactions that are enabled by them. For Bangladeshi participants, this social media platform was Facebook. For example, the practice of searching in this contest was done using the Facebook search feature and examining the reviews and comments of the respective Facebook pages. After finding a good and trustworthy admin or service provider, the participants usually continued to get accounts or renew accounts from that person. Each admin would set their means of communication. Sometimes it is Facebook Messenger, sometimes it is WhatsApp group. This process is how the practice of clientelization is carried out in this online space. Participants informed us about negotiating terms with admins, like whether they are willing to pay only for the account but not own the account, which demonstrates the practice of bargaining. We have also found instances of the practice of testing by taking the account from one provider for one specific platform for one month to see how it goes. We found that a vital difference between physical and online marketplaces is that, in physical marketplaces, even if the two parties are not known to each other, the exchange of the product and money is mostly direct; on the other hand, the exchange in the online marketplace in social media is done indirectly. The account user pays for the account upfront through local mobile banking services when they have no assurance that the account will

be good for the promised period of time. The reason for taking this kind of risk, as expressed by our participants, is the comparatively low stakes. The price of a monthly subscription in a shared account is comparatively low or affordable to our participants so that if anything happens, it is not a great loss to them. So, there is a question of whether this kind of practice would have been sustained for a cause where higher risk is involved.

In previous literature on informal marketplace, use of traditional technologies like the intercom system of SP road of Bangalore has been highlighted as tools for collaboration. In our study on the marketplace for online subscription-based services, we also found the aspect of collaboration, but it was not enabled by any traditional technology rather that emergent practices from social media use and driven by on the social motivations.

The role of social media pages and student group admins is another form of intermediated use. The previous exploration of intermediated use mostly presented as a tool to overcome digital literacy and technology access [37, 44]. However, in the case of our study, it is reasonable to think that the account users and admins have similar levels of digital literacy and access to technology. This intermediated use is mainly caused by the payment difficulty and the stakeholders took different roles as users and service providers.

6.3   End-user Perceptions on Using Alternative Platform Access Methods

We have also described the participants' perception of accessing subscription services using informal account-sharing approaches and their opinions on the policies of the platforms. Participants expressed a desire to access accounts through official channels, citing concerns about the legitimacy and ethics of alternative methods. However, given the current infrastructural issues, they were unable to utilize these methods and described preferences for the creation of future accessible payment methods and more equitable access to online digital content irrespective of geographical location. We acknowledge that many of the limitations in available online content are often due to international copyright laws that the online content providers have to adhere to. Regardless of this issue, we believe that understanding users' perspectives about regional limitations is important in that it may motivate changes in policy for increased equity or, at the least, better communication about reasons behind differences.

Another finding is that participants reported few concerns about privacy and seemed to implicitly prioritize access over it. This is in line with previous research in contexts, such as low-resource communities with limited Internet connectivity, where significant infrastructural challenges to accessing services and information exist [27]. The undermining of privacy can have significant negative consequences, and we believe there are opportunities to improve the user's awareness of privacy in this context through training or awareness-raising efforts. There are also interesting research opportunities to investigate how privacy awareness changes when modes of access change over time.

Finally, our work shows that access to the growing system of online cloud-based content and the subscription-based methods to access them breaks down in Bangladesh due to a disconnect of the local financial infrastructure to the international financial one that underlies and enables the implementation and success of subscription-based services. In the vacuum of formal ways to access these resources, infrastructuring efforts both by intermediaries and users themselves start to take place and bridge the gap. These take the form of intermediaries creating informal businesses that focus on redistributing accounts and content and end-users themselves redistributing shared resources in friends groups and in hacker and activist groups.

6.4   Implications for Practice and Policy

Our findings show significant infrastructural challenges in accessing online subscription-based services in Bangladesh and potentially in other similar countries in LMICs. We also found that users in these contexts have an increased need and desire to access these services, which has resulted in the emergence of an informal ecosystem for overcoming the infrastructural challenges and enabling the access and sharing of services through local intermediaries and administrators. In this section, we discuss the implications of our findings for practice and policy.

The major barrier we found in accessing services was the difficulties involved with international payment, which is currently necessary to pay for international online services. This issue emerges from both the financial policies of the Bangladeshi government and the willingness and accommodation of most platforms themselves to offer alternatives to using dominant international payment services. We found that users are interested in paying for these services in their local currency. We also found that some international platforms, such as YouTube, already worked with local financial institutions and businesses to make their services available in Bangladesh using local currency or payment methods that are convenient for users. For example, YouTube made paying for YouTube Premium and YouTube Music services officially available in Bangladesh using BDT (Bangladeshi Taka) in August 2023 [52]. Another example is the partnership between GrameenPhone, a popular cellular network operator in Bangladesh referred to as GP, and Spotify to give access to GP Spotify for GP subscribers through Director Operator Billing (DOB) that lets users pay with their mobile balance [48]. More initiatives like these can open up access to other international platforms.

Despite this possibility, we also observe that even if more and more popular platforms enable local users to have access to their services through future initiatives, this approach will not automatically resolve the difficulties of accessing new emergent platforms and services that initiate in the Global North and are needed and desired by users in the Global South. Rather, it results in a "whack-a-mole" approach [53], where infrastructural challenges are addressed one by one and as they arise, rather than in a fundamental manner that addresses multiple issues at the same time. For example, a more fundamental approach would require recognition on the part of the Bangladeshi government that current financial processes are creating significant barriers to accessing online services and resources and need to be alleviated by innovative reform. Addressing this issue would need active cooperation from the government and adjustment of their financial policies. For example, Bangladesh has strict guidelines about how much foreign currency one can spend in a year [3], which is why any amount of foreign currency one wants to spend through debit, credit, or prepaid cards must be endorsed in their passport. Until now, this process of endorsement is done by going to the banks in person causing significant time costs to individuals. Also, the endorsement process requires a passport, which is inconvenient for many users. The government can investigate opportunities to open up this process using other identifications, such as the National Identification Card (NID) that all Bangladeshi citizens possess. Furthermore, Bangladesh's government has prioritized making many of its services available in digital forms in recent years. We propose that the foreign currency endorsement process also be digitalized to increase convenience for users. We recognize that these proposals may not be easy to implement in practice, as many governmental procedures are carefully designed to detect fraud and other forms of financial abuse. Thus, innovations need to be carefully weighed, with risks balanced against the continued challenges of end-users' access to international services.

In parallel with efforts on the government side, we also encourage major platforms to reflect on why these barriers exist so that people in the Global South can access their services. The examples we provided above of positive initiatives by YouTube Premium and GP Spotify came in comparatively late, considering the popularity and desire for these platforms in Bangladesh.

Also, the majority of major platforms have not taken initiatives like these yet. A fundamental question here is why access solutions often come as an afterthought. We would like to envision a future where platforms consider issues of access in the Global South early on. If it is not possible to give convenient access to people in the Global South for different infrastructural reasons, they can provide better communication about their efforts and existing barriers to increase trust and encourage innovation. We also see potential in these efforts to increase transparency to facilitate collaboration with local entities that can serve as formal intermediaries and spearhead efforts to increase access.

Finally, in terms of account-sharing policies, we noticed some practices involving intermediaries and informalities may technically violate the terms of services (ToS) of the platforms. For example, Netflix's policy of restricting the use of one Netflix account for only one household could be violated by people unfamiliar with each other sharing accounts. This kind of policy does not always make sense in practical situations and from user perspectives in Bangladesh. Previously, HCI scholars have characterized similar situations as reasonable or unreasonable sharing [29], where reasonable sharing occurs when the terms of services (ToS) are violated, but the revenue for the account-providing platform is not reduced, and unreasonable sharing occurs when the ToS is violated, and the revenue is also reduced. Many informal ways of sharing accounts can be transformed into reasonable sharing if users can find alternative ways of paying the platforms indirectly. We encourage platforms to revisit their ToS agreements to enable and support these practices, especially in Global South contexts. We believe that this approach will not only increase equitable access to their services and platforms but also result in increased revenue since large numbers of users in the Global South are highly motivated to use these services.

7 Limitations and Future Work

Our study has several limitations that can be addressed by future work. First, our study sample consisted mainly of young adults with a strong representation of college students or graduates. While we chose this sample as this demographic is more likely to use subscription-based services, future research can complement this work by including perspectives from other demographics, such as older adults. Second, while we attempted to recruit admins and intermediaries who sell shared accounts in Bangladesh, we were unable to engage them in the current study. A future research direction would investigate their perspectives, which can be combined with a document analysis of how they promote their online services. We also recognize there is a disparity in the ratio of recruited male and female participants (15 males compared to 7 females). While we strived to recruit similar numbers for each gender, we faced some challenges in recruiting female participants. This may have been due partially to the first author being male and relying primarily on his contacts during the first round of recruitment. We have not noticed any significant differences between male and female experiences, but in the future, a more balanced participant pool can confirm these results. Finally, a future study can also investigate the perspectives of representatives from companies, such as Netflix or Amazon Prime Video, that make decisions about international outreach and explore how current limitations can be addressed.

8 Conclusion

Our study provides a detailed account of the underexplored domain of online subscription-based service adoption and sharing in Bangladesh. By analyzing this distinct ecosystem of Bangladesh, we contribute to the broader understanding of the dynamics of the online informal marketplace, its mechanisms, and its challenges in an example LMIC. We also provide an update on the media-sharing landscape of the Global South by reporting on the adoption of online subscription-based services. Our findings describing the perspective of the users on access difficulty, ethics of adopting

alternative methods, and the policies of these service-providing platforms can inform future efforts creating more equitable subscription-based services and policies for users in Bangladesh and beyond.

9 Acknowledgment

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A Appendix

A.1 Interview Protocol

Personal Information and Background

(1) Age, gender, educational background, profession

The Nature of Digital Services They Use and Share

(2) What kind of digital devices do you use?

(3) What kind of online subscriptionn-based services do you use? (e.g., Netflix, Amazon Prime, edX, Grammarly)

(4) When do you remember starting to use these services?

(5) Among the services you mentioned, which platforms are paid and which ones are free?
   (a) Why would you be willing to pay for some services?
   (b) How do you get access to the paid platforms (how do you pay; do you face any difficulty)?

(6) Among the platforms you just mentioned, did you share your accounts with other people?

Since you mentioned that you share an account on *, I'm going to ask you some questions related to that.**

(7) You mentioned that you share an account on ***,
   (a) Who do you share the account with?
   (b) How did you start the share in this particular case?
   (c) Why do you share the account in this case?

(8) In case of sharing with friends, how did you get connected and initiate the sharing process?

(9) Do you sometimes use services sharing with someone you are not actually friends with?
   (a) How do you define or see that relationship?
   (b) How did you get connected?

(10) Do you get help from any social media page, group, online forums, or other person for getting connected and starting using shared services?
   (a) How does that happen? Can you give us an example, like the last time when you got help from a social media group?
   (b) Why do you do that?
   (c) If you get your account from any other person/group/page or informal business, who owns the account? What control does the account provider have on your accessibility and data?
   (d) Do you (or do you need to) communicate with whom you are sharing the account?

(11) Do you see any benefit in using these accounts in this way? Also, do you have any concerns?

(12) (For specific platform) If you use different profiles under one account,
   (a) Have you looked at the controls you have for your profile?
   (b) Did you like the controls you have for your profile?
   (c) Do you see any benefit in using the profile controls or do you have any concerns about them?

Account Sharing Policies by the Platforms

(13) What do you know about the account sharing policies of the platforms you use?

(14) What do you think of the account sharing or non-sharing policies by the platforms?

(15) If the platforms want to stop certain kinds of sharing, what would you feel?

Stopping Account Sharing and Consequences

(16) Have you ever stopped sharing accounts you previously used to share?
   (a) Why did that happen?

(17) Do you have any concerns after ending the sharing?

Closing Questions

(18) Is there anything else you would like to share?

(19) Are there any other questions you wish we could discuss that I didn't ask?

A.2 Summary Table of Key Findings

In Table 2, we summarize the themes, the subthemes within each theme, and some example codes.

Table 2. Overview of Findings with themes, subthemes, and example codes. This overview of findings is not comprehensive but provides highlights from the findings. Example codes are not exhaustive for each theme and are presented to illustrate the kind of codes we identified for each theme.

Themes	Subthemes	Example Codes
The Shift Towards Online Subscription-based Services in Bangladesh (5.1)	• Platforms used/popular among users, and why (5.1.1) • The previous practices (5.1.2) – using physical media and torrents • Factors leading to the shift towards online subscription-based services (5.1.2) – Online platforms becoming popular during COVID, Internet availability and affordability	"Platforms (participants) want to use", "Offline sharing", "Torrent downloads"
Obstacles for Accessing International Subscription-based Services (5.2)	• Payment difficulties – having to pay in USD instead of local currency* • Procedural difficulties – process for enabling international payment gateway, the dollar endorsement process* *combined into one section	"Inaccessibility of dual currency cards", "Dollar endorsement as an obstacle"
Strategies to Overcome Obstacles to Accessing Online Subscription-based Services (5.3)	• Accessing subscriptions and online media through local social media pages and groups, and streaming services (5.3.1) • Accessing subscriptions and online media through friends, family, and social groups who have access to international payment (5.3.2)	"Getting account from social media pages", "Getting account from someone living abroad"
Social Motivations and Dynamics Among Subscription-based Services Account Sharees (5.4)	• Social motivations* • Sharing dynamics: sharing with unknown people vs known acquaintances* • Concerns while sharing with others* • Coordination and collaboration among sharers* *combined into one section	"Helping friends with resources", "Comfort in sharing with friends"
Perspectives on Informally Using Online Subscription-based Accounts (5.5)	• Concern about using informal methods* • Need for convenient payment procedures in local currency* *combined into one section	"Suspicion on how the account is created", "Preferred to pay by themselves if option was available"
Perspectives on Future Equitable Platform Practices (5.6)	• Revisiting sharing policies* • Expanding content availability* *combined into one section	"Opinion about account sharing policies", "Payment process should be easier"