In-Between Visuals and Visible: The Impacts of Text-to-Image Generative AI Tools on Digital Image-making Practices in the Global South

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ABSTRACT

This paper joins the growing body of HCI work on critical AI studies and focuses on the impact of Generative Artificial Intelligence (GAI) tools in Bangladesh. While the West has started to examine the limitations and risks associated with these tools, their impacts on the Global South have remained understudied. Based on our interviews, focus group discussions (FGD), and social media-based qualitative study, this paper reports how popular text-to-image GAI tools (ex., DALL-E, Midjourney, Stable Diffusion, Firefly) are affecting various image-related local creative fields. We report how these tools limit the creative explorations of marginal artists, struggle to understand linguistic nuances, fail to generate local forms of art and architecture, and misrepresent the diversity among citizens in the image production process. Drawing from a rich body of work on critical image theory, postcolonial computing, and design politics, we explain how our findings are pertinent to HCI's broader interest in social justice, decolonization, and global development.

CCS CONCEPTS

• **Human-centered computing → Computer supported cooperative work**.

KEYWORDS

Artificial Intelligence, Generative AI, Image, Art, Architecture, Urban Design

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1 INTRODUCTION

Generative Artificial Intelligence (GAI) systems are becoming popular worldwide for their ability to create "new" content, such as texts, images, music, codes, etc., based on existing data [103, 117]. Various industries, from art to gaming to marketing, are focusing on leveraging the potential benefits of GAI in their own production systems. In particular, GAI's ability to produce outputs in the same or different mediums in which it is prompted (for instance, *text-to-text*, *text-to-image*, or *image-to-video*) has sparked new conversations in the creative fields, including art, architecture, film, and literature. On one hand, many people appreciate how GAI's Large-scale Language Models (LLMs) and text-to-image (TTI) models are generating highly realistic and human-like content that can enhance creativity, productivity, and learning by providing new possibilities, solutions, and insights. For instance, creating realistic images, animations, or videos using GAI has bypassed many complexities and skills needed to run associated software. Writing codes, designing software, or debugging errors have been easier than before [93]. Ideating movie or novel plots have received new dimensions as GAI can help synthesize available billions of data in no time [148, 154].

On the other hand, many are raising questions about the authenticity associated with creating such content using GAI [49]. Many people are feeling afraid of losing their jobs [93, 150]. Recently, the Writers Guild of America (WGA) warned of the possibility that generative AI could allow studios to cut costs by forgoing the employment of human writers for AI-produced scripts [15, 16]. Moreover, creating fake or misleading content, infringing intellectual property rights, or violating privacy or security through GAI can pose ethical, legal, and social threats [140]. Generative AI systems can also cause harm, bias, or discrimination by generating offensive or harmful content, amplifying existing inequalities,

or excluding marginalized groups [37, 121]. The ongoing debates around the ethical use of AI suddenly accelerated as online GAI tools, such as ChatGPT (for text generation) and Midjourney (for image generation), became freely available online. Now, the world has access to GAI through various platforms and services that offer user-friendly tools and interfaces to interact with GAI models. Although these models and interfaces are mostly designed, developed, and deployed in the Western world, their popularity[1] rapidly transcended the "boundaries of the North" and became popular in many parts of the Global South [117]. While a rich body of literature in HCI, ICTD, and related fields has studied the impacts of various computational interventions on different domains of the social, political, and economic lives in the Global South, how GAI systems and the contents they are producing are impacting the cultural identity of the locals here- have still remained understudied.

We address this gap through our five-month-long ethnography-inspired qualitative study in Dhaka, Bangladesh, with several groups of "image practitioners". By "image practitioners," we refer to those people in Bangladesh, who produce or generate digital images as a part of their profession. They include architects (who produce representative drawings to communicate design ideas), visual artists (such as digital painters, graphic designers, illustrators, etc.), content artists (who explore the design of characters, creatures, and environments in an animated movie), commercial artists (who make advertisements for different brands, movies, series, and/or other digital/material contents/objects), UI/UX designers, among others. Our study involves interviews and focus group discussions with such image practitioners, observation and documentation of their GAI image production, and analysis of GAI images and video tutorials shared on social media. Based on our findings, our paper makes a three-fold contribution to the HCI scholarship.

(1) We present one of the very first HCI works on a detailed empirical account of GAI-induced cultural and economic marginalization through the major phases of digital image production. We document how creative ideas from low-literate marginal artists, linguistic metaphors, local art and architectural styles, context-representing visual dialects, and the notions of positive social transformation through artworks, among others, are being challenged by GAI tools and technologies.

(2) Drawing from critical art, architecture, and image theories, we advance the postcolonial HCI literature to conceptualize the impact of GAI on the cultural depiction and imagining the future of the Global South. Our ethnographic fieldwork reveals how GAI systems promote image-mediated colonization through the exclusion and/or distortion of local cultural components.

(3) We discuss design implications for HCI, art, and architecture disciplines to address some emerging concerns (e.g., equity, accessibility, representation, and ethical/moral sensibilities toward local socio-cultural norms) pertinent to GAI in the Global South and beyond.

[1]For instance, ChatGPT, a widely used text generation tool, achieved a remarkable milestone of reaching one million users within the first week of its launch. According to web analytics, ChatGPT is currently the most visited text generation platform, with an estimated one billion monthly visits and a hundred million active users.

2 RELATED WORK

In this section, we look at the emerging scholarship on Generative AI through the lens of critical HCI, Data Colonialism, image politics, and Postcolonial Computing.

2.1 HCI, Image-making, and Generative AI

We open our literature review by looking at the existing work in the intersection between HCI and digital illustration. One of the major strands of work in this enormous area is designing and developing hardware tools and software applications to support image practitioners in illustrating and communicating with illustrated images. Multiple image-making tools *(Adobe Lightroom, Adobe Photoshop, Capture One Pro, DxO PhotoLab, Skylum Luminar Neo, Photoscape)*, digital painting software *(Affinity Photo, Rebelle, Artweaver, Auto desk Sketchbook 8.4)*, vector-editing illustration software *(Adobe Illustrator, Adobe capture, CorelDRAW, Inkscape, DesignEvo)* have already been launched to leverage practitioners creativity [3, 11, 12]. Drawing and rendering techniques including stroke pattern analysis [25, 70], texture synthesis [48, 83], shape manipulation [65], brush tools development [113], pen and ink [72, 114, 146], watercolor [46, 135], among others, have advanced the transitions of image-making from physical to digital. The emergence of augmented and virtual reality and associated technologies further advanced image-making experiences and added new dimensions to communication and "consumption" of images [19, 26, 54, 73, 81, 102, 118, 139].

The newest and probably the most exciting addition to this line of tools for digital image generation is generative AI. Today, almost all popular digital image-creating software tools have adopted some AI techniques to facilitate ease, perfection, and speed in creating images. The recently launched image generators i.e. Jasper Art, Midjourney, Starry AI, Dall-E 2, Dream by Wombo, Nightcafe, Pixray, etc., are helping practitioners in idea-generation, exploring different artistic and aesthetic styles that come with personalization and customization within the shortest possible time [1]. Text-to-image AI-driven approaches supported by diffusion models and Natural Language Processes (NPLs) like Midjourney, DALL E 2, and disco diffusion are up for changing the visual landscape for creative arts [98]. Recent studies show the evolution of text-to-image generation, highlighting its increasing relevance, applicability, and criticisms [92, 95, 108, 117]. On the one hand, HCI scholars are doing user-based analysis to find out the potential that these large-scale text-to-image generation models are providing to various subgroups of visual artists [74]. An extended line of this work has started reporting existing concerns and future dreams around GAI in specific industries [138]. On the other hand, critical analyses of GAI have also started to surface adversities that various stakeholders are experiencing. For instance, Ko et al. have documented large-scale text-to-image generation models' limitations in supporting personalization in image-making and text promptings-induced restrictions in creativity [74]. Bird et al. report typologies of risk ranging from discrimination and exclusion to misinformation and misuse [32].

Bianchi et al. have advanced this critical thread and investigated how these models can amplify complex and often dangerous stereotypes, such as reinforcing whiteness as ideal, amplification of racial and gender disparities, and reification of American norms, among others [30]. In addition, critical evaluations of popular text-to-image models are happening to investigate visual reasoning capabilities and social biases [43].

The above-mentioned series of work has made an immense contribution to HCI by starting critical conversations around GAI and image-making. However, in most cases, these studies either present generalized versions of risks associated with text-to-image models, are limited to lab-based analysis, or are primarily centered on Western industries and stakeholders. A nuanced study of how these risks, biases, and stereotypes are formulated and materialized through GAI and other technical instruments in the Global South is still absent. In addition, how these new GAI technologies are complicating already-existing biases, discrimination, and adversities in postcolonial countries, where contexts, challenges, and opportunities significantly differ from the West, has still remained understudied. Our paper addresses this gap and broadens the scope of inclusive appropriation of text-to-image models for contexts like Bangladesh.

2.2 Data Colonialism, Generative AI, and Postcolonial Computing

Data-driven technologies, including AI, have the potential to transform various aspects of human society, such as the economy, education, health, and culture. However, AI also poses significant ethical and social challenges, such as bias, discrimination, privacy vulnerability, and environmental degradation [22, 45, 99, 122, 141]. These challenges have drawn the attention of many scholars from different disciplines, who have examined and critiqued the theories and practices of AI from various perspectives [45]. Among these perspectives, one of the most important and urgent ones is the decolonial perspective, which addresses the colonial ideologies and assumptions that underlie the dominant forms of AI, and their impacts on the historically marginalized and oppressed groups in the Global South [18, 35, 89]. The concept of data colonialism helps us better understand the colonial functioning of extractive AI systems. Data colonialism particularly concerns the free extraction of data from the 'Global South' or poor nations [5, 80], which creates new forms of social discrimination and behavioral influence by corporations [2, 80, 89]. According to Couldry and Mejias, data colonialism is the process by which governments, corporations, and other actors claim ownership of and privatize the data that is produced by their users and citizens through communication networks developed and owned by digitally leading nations [44]. Most AI tools available today extract 'free' data from the Internet (and other sources), to provide services that also produce further extraction of data [45]. Data of millions of users of these tools who live in the Global South are regularly extracted by these AI systems without proper consent, creating a global AI business for the big tech companies [5, 13, 55]. Generative AI for image production, which creates novel content from data, can lead to data colonialism [59, 101]. Generative AI systems for images, including DALL-E 2 and Midjourney, generate images from text prompts, but also from other images, such as sketches, paintings, or photos [33, 84]. Their use can contribute to exploitation, inequality, bias, loss of control, and harm to the data producers in the Global South, who are often underrepresented and unprotected in the data sources used by generative AI systems [59, 101].

This concern around data colonialism is also connected to the growing HCI literature on postcolonial computing, which is defined as "an analytical orientation to better understand the challenges and opportunities for design and development in a global context" [67]. HCI researchers have criticized the uncritical transfer of Western technologies to the Global South, by providing ethnographic evidence of technical failure, cultural mismatch, cultural imperialism, and environmental violence, among others. Very recently, scholars have also started to point out the problems associated with the use of "Big Data" in the Global South contexts [115, 120]. Starting from government-imposed surveillance to labor exploitation, scholarship in HCI and related fields has demonstrated how AI has imposed a new threat for the Global South, adding to the existing problem of postcolonial computing [120, 130]. Singh focuses on the way big companies take and use people's data without their permission or benefit [119]. He argues that data colonialism is like land colonialism, which is when rich countries took and used the land and resources of poor countries in the past, and that data colonialism can hurt the people in the Global South by making them lose their culture, identity, privacy, and security. Gray argues that this mode of unrestricted data supply from the Global South to the Global North can harm the people in the Global South by making their knowledge and value less important or invisible, and by making the knowledge and value of the Global North more dominant or universal [55]. However, Taylor argues for not taking the Global South as a 'problem' to be solved [128]. He invites the HCI scholars to learn from the AI use in the Global South, and see the world as an interconnected network, and conceptualize the problem caused by AI in a holistic way. Amurte and her colleagues take this argument further showing how the Global South is often contributing to the escalation of some of the most critical problems created by computing technologies, including electronic waste, unfair surveillance, and electronic fraud [23]. These and many other recent works demonstrate how scholars have emphasized studying the use of AI technologies in the Global South - both to understand their broader impacts on society and to learn how to approach some of the problems in an effective manner. Despite such emphasis, studies of AI in the Global South have remained limited, and they mostly focused on the politics of data annotation, data bias, and unequal access. Most importantly, the use of generative AI tools, and their social and economic impacts have got little attention in this scholarship. This paper focuses on this topic and enriches the HCI scholarship by providing a nuanced understanding of the use of generative AI tools by image practitioners. Besides revealing a broader understanding of the impacts of these tools on society from an ethnographic account, this study also provides lessons for how local practitioners are using these tools by aligning those with the local interests, demands, skills, and cultural sensitivities.

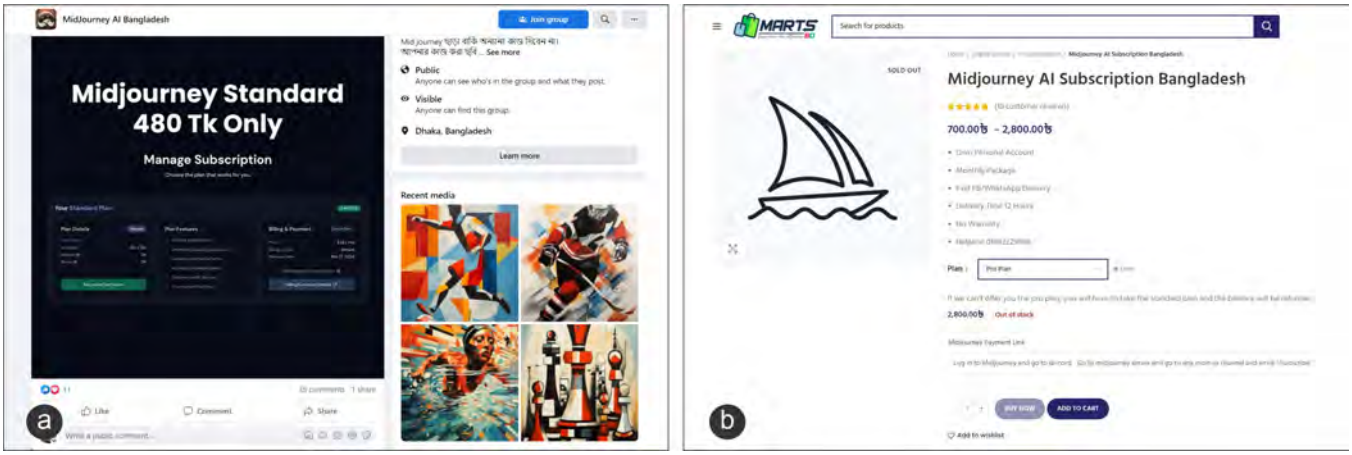

Figure 1: (a) An advertising post on a public Facebook group named "MidJourney AI Bangladesh" for shared Midjourney subscriptions for 4.38 USD/month. (b) Digital Marketplace MARTSBD is selling Midjourney Subscriptions on its website. Prices range from 6.39 USD to 25.55 USD. A purchased subscription is "delivered" via Facebook or WhatsApp within 12 hours of payment through this website.

3 METHODS

We conducted a five-month-long ethnography-inspired qualitative study [57, 96] in Dhaka, Bangladesh, from February to June of 2023. Our research team consists of academically trained visual artists, architects, and computer scientists- born and raised in Bangladesh and experts in critical social science research. The data collection process of our study involved looking at four key areas and deploying multiple modalities of qualitative research. These four key areas are: (i) social media, (ii) working domains of image practitioners, (iii) tutorials and beyond, and (iv) academic sectors. Each of the key areas has multiple phases of data collection (see Table 1). In the following paragraphs, we describe how we selected these key areas and document each phase of our data collection and analysis in detail.

As is common in ethnographic and qualitative studies [58], we started our research with a broad objective to identify the impacts of generative AI tools in image production and exhibition in Bangladesh. First, due to the popularity of Facebook in Bangladesh, we focused on finding public Facebook posts from Bangladeshi social media users that include AI-generated images. Initially, we used the Facebook search tools and keywords (Bangladesh, Facebook, AI, Midjourney, Stable Diffusion, artist, AI artist, BD, Photoshop, Firefly, AI image, AI photo, generative AI, etc.) to find such posts. These searches started to reveal a wide variety of AI-generated images, ranging from portraits to rituals to everyday scenarios to futuristic visions. From these searches, we excluded the posts that were not posted by Bangladeshi nationals (decisions were made based on the accompanying text and the posters' profiles). Following the search results, we discovered a set of 15 relevant Facebook public groups that were actively sharing AI-generated images. We excluded the groups that were not very active (see set the minimum criterion at one post per day). We also listed a few Bangladeshi Facebook users who were posting AI-generated images on these groups frequently. This process led us to our second phase of data collection, where we started typology analysis of the posts and images attached, grouping and sorting the posts and images. To limit our study, we primarily focused on images that exhibit various spatial scenarios. Unlike the images of commercial products, animals, fictional characters, foods, ornaments, aliens, zombies, etc., spatial images provided us with more information about sociocultural contexts, local art and architectural styles, and broader scopes to identify cultural stereotypes and biases. We also excluded any videos or GIFs. After two months, we ended up collecting a total of 575 images (and related posts) illustrating various spatial scenarios ranging from a market scenario from Mughal Bengal to

Key Areas	Data Collection Phases
Social Media	(a) qualitative studies of Facebook profiles, pages, and groups from Bangladesh that shared AI-generated images, (b) typology analysis of the posts and shared images, (c) a thorough analysis of the comment section for each post
Working Domains of Image Practitioners	(d) recruitment of image practitioners and short-listing participants for our interview study, (e) online interviews with the image practitioners, (f) virtual observations of their working process in producing AI-generated images
Tutorials and Beyond	(h) observation and documentation from the video tutorials by Bangladeshi content creators on producing GAI images, (i) interview with GAI image tutorial-based content creators
Academic Sectors	(j) online and offline interviews with academicians and students from art and architecture schools

Table 1: Key areas and data collection phases

Ramadan in the old Dhaka city with Hollywood stars to Dhaka in 2050. We went through the comment section of each of these posts and collected public discussions around these AI-generated images.

Next, we reached out to 67 Facebook users who shared the images we were studying. Many of these users opened a new Facebook page to share their work. We tried to reach out to the admins of those pages via Facebook Messenger and invited them to participate in our study. We added a brief introduction of ourselves and our project to the invitation. We ended up having 26 participants for our semi-structured interview study over Zoom (14 male and 12 female, 22-38 years age range), of whom 17 were image practitioners, and nine were amateur artists. Only two of them had an academic background as artists. We asked them about the AI platforms they used, the challenges they faced, the impact of AI on their professions, and their learning processes, among others. We also asked them to produce images before us during the interviews, observed their working process, and made contextual inquiries.

To include more perspective around GAI image production from academically trained and practicing artists and architects, we recruited another 15 image practitioners for interviewing (eight male, seven female, age 22-45 years) from our social network using convenience sampling [51]. We used our social network to reach out to these participants. Semi-structured interviews were taken either in person or online, depending upon the availability of the participants. We asked them about their first impression of the AI platforms for image production, how these platforms could benefit/ harm their professions, how their work/ working process could be aided or hampered, how their clients were thinking about AI-based image generation, how their previous skill sets associated with their profession were impacted by AI, among other questions. We shared some AI-generated images with them and asked for their professional opinions/comments on these works. Some participants shared their AI-based work and experiences while "prompting" these images.

As our final step of data collection, we wanted to document the ongoing practices and future plans of the country's leading Design/Art/Architecture schools around GAI systems in training their students. We interviewed seven academicians and ten students from three art and architecture schools. We conducted eight semi-structured interviews and three focus group discussions (FGDs) to learn about institutional policies, current applications in various studios, design/ creative imaginations, and academic visions around emerging AI platforms.

In total, our study produced 49 semi-structured interviews, 3 FGDs, 780 hours of online observation, more than 300 pages of notes, more than 1000 AI-generated image analyses, and more than 350 hours of online and offline conversations. The interviews were 1 hour 35 minutes long on average. Participation in our study was completely voluntary and unpaid [2]. Instead, we provided them with various culturally appropriate 'nice gestures', including sharing their posts on Facebook, offering food, helping with navigating some software, etc. The interviews and FGDs were all conducted in Bangla. The semi-structured interviews and FGDs were audio and/or video recorded with the participants' permission. We transferred the recordings to a secured computer. All the interviews were transcribed, translated, and anonymized by the members of this research team, who are fluent speakers of Bangla and English.

We started analyzing the anonymized qualitative data by following the inductive approach [132]. As a team of authors, we conducted a rigorous examination of the transcripts of the interviews and FGDs. We iteratively reviewed each transcript to isolate and eliminate the irrelevant segments, and to emphasize the pertinent segments that addressed our research questions. We also engaged in frequent virtual meetings to discuss the eliminated segments and ensure we did not overlook any significant excerpts. Subsequently, we analyzed the relevant data (interviews, notes, and FGDs) after anonymizing them using open coding [123] and thematic analysis [34]. Here, we should mention that we did not have any predetermined themes to ensure openness to any emerging themes. We grouped the data into patterns based on their similarities and differences and then synthesized the patterns into themes that reflected our findings. We conducted several rounds of rigorous analysis of the codes and themes among the research team members and developed the final themes that are presented in the following section. The research protocol was examined and approved by the research ethics board of a Bangladeshi University, and a North American academic institution.

4 GENERATIVE AI AND CONTEMPORARY IMAGE PRACTICES IN BANGLADESH

To better understand the impacts of various GAI systems, and the images these are producing in the Bangladeshi context, we turn to the emergence, popularization, and operations of these systems here. Bangladeshi image practitioners, who create digital images such as artworks, illustrations, and representational drawings, mostly use worldwide popular software applications, including *Adobe Photoshop*, *Adobe Illustrator*, *AutoCAD*, *Rhino*, *Corel Draw*, *SketchUp*, and *Lumion*, among others. Due to the high prices of these applications and the complexities of international payment systems using credit/debit cards, many image practitioners rely on pirated older versions of the applications that are available in local informal markets. Hence, although the latest versions of many of these applications often have built-in GAI features, those cannot reach the majority of image practitioners (yet). Instead, independent GAI systems with free web-based applications, including *Midjourney*, *DALL.E*, and *Stable Diffusion*, have gained more popularity among them. Images that are produced through GAI and shared on social media platforms (primarily, Facebook and Instagram) by foreign artists, inspired thousands of Bangladeshi image practitioners who then try GAI and explore GAI's potential in their professions. Many local image practitioners started sharing their GAI-produced work on popular public Facebook groups and pages (some of these groups have more than ten thousand members/followers) that showcase creative content like sketches, paintings, photography, digital illustrations, poems, stories, etc. Within a few months, many new Facebook groups (both public and private) started to share and discuss only GAI images (for instance, *Midjourney AI Bangladesh, Midjourney AI Bangladesh Community*). Many image practitioners opened new pages to promote their work aided by GAI. Some of

[2]According to the culture of Bangladesh, it is considered awkward to offer money to someone for such 'talking'

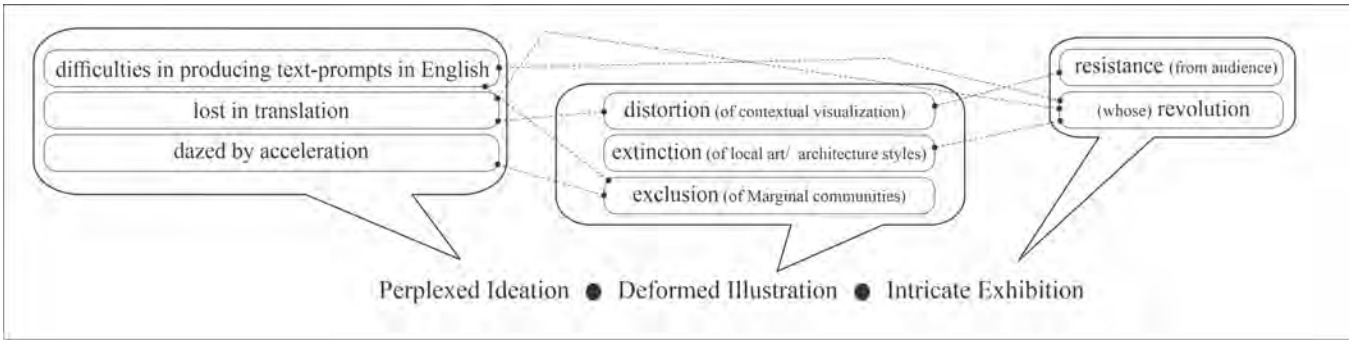

Figure 2: A diagram that synthesizes the findings from the fieldwork to facilitate their comparison and connection to the study's broader impacts.

these groups and pages also shared text prompts they used, and/or the tutorials they watched to generate their images with GAI. Several Bangladeshi YouTube content creators have also made video tutorials on *Canva* (new AI features added), *Microsoft Bing Image generator*, *Playground.com*, *Lexica.art, Picfinder.AI, Leonardo.AI, Disco Diffusion*, and *Adobe Firefly* and shared on Facebook. Apart from sharing images, prompts, and tutorials, some people started offering shared Midjourney subscriptions on those Facebook groups. Several online/digital marketplaces started to "sell" Midjourney subscriptions through their websites [8].

Today, many image practitioners are considering GAI as an essential tool to survive in the emerging world of digital images. From self-taught graphic designers to young artists, and from architects to ad firm professionals- a large group of people are trying to learn how to use these GAI image-producing systems. In addition to the YouTube tutorials, a significant number of online and offline learning workshops and courses are being offered [6, 10]. These workshops and courses are attracting many newcomers as well who envision GAI expertise as their future source of income. The applications of GAI-induced images have gone beyond sharing on social media. Popular brands, ranging from telecommunication to apparel, have started incorporating GAI in their marketing strategies [7]. Design schools have started to think about how their students can better use GAI, without sacrificing their own creative ideas and skills. Many architectural firms are considering the replacement of visualization and rendering specialists with GAI technologies for architectural representations. All these events point toward a large shift that is taking place in the creative domains in Bangladesh, along with the burgeoning growth of GAI worldwide.

5 FINDINGS

Our data reveals a wide variety of ways in which GAI impacts digital image production and use by local image practitioners. To better articulate the findings, we group these impacts on the three key phases of image production: ideation, illustration, and exhibition. In the subsections below, we explain the direct impacts of the emerging GAI systems and tools on each of these phases and present the nuanced cultural, social, and economic responses toward GAI applications.

5.1 Perplexed Ideation

We open our case analysis by documenting how GAI systems have initiated a perplexed ideation phase for local image practitioners. According to our participants, "ideation" of an image is the first step in producing or generating various images digitally. By ideation, they mean the process of imagining an image before drawing/painting/creating it. This is much like the ideation stage of "design thinking" [36] but mostly guided by an artistic drive (as opposed to a "problem-solving" mandate). Our participants described various ways they ideate an image. Some sketch on paper, some make collages of downloaded images, some directly make drafts using software, and keep ideating as they go. However, using GAI services online changed this ideation phase. The popular GAI service in Bangladesh, Midjourney, needs text prompts to generate images. Creating images with different text inputs, instead of different "visual" attempts, is a big shift for them. Some of our participants likened learning this text-to-image process to learning the drawing/ illustration software. For instance, one of our participants mentioned,

> *" Before the prevalent use of AutoCAD[3], architects and the students of this discipline used to draw/draft manually. AutoCAD brought new words to the drawing methods, such as offset, trim, snap, etc. I think text-based prompts will need a similar but extended set of words to generate the images we want."*– Pallab (Pseudo name, male, 36 years old, practicing architect, and a faculty member at an Architecture School)

However, many other participants in our study mentioned their struggles in conceptualizing ideas and converting those into texts to generate images while using GAI systems. The following cases document how the imaginations of many image practitioners are being shaped, modified, distorted, and often bounded by the various GAI tools, which in turn trigger a perplexed ideation phase limiting the potentials of marginal creative minds.

5.1.1 *Difficulties in Producing Text Prompts in English:*

"Text-based prompts need proficiency in English nouns and adjectives to explain the idea of an image to the GAI system to receive an

[3] a 2D and 3D computer-aided design software application for desktop, web, and mobile developed by Autodesk

Figure 3: Low-literate local graphic designers with their unlimited imagination yet limited vocabulary struggle to produce text-based prompts. Their ideas get marginalized as interaction with GAI is complicated for them.

outcome that matches the image practitioner's imagination."- said one of our participants, who is an academician in one of the prominent art schools in Bangladesh. For thousands of marginal, low-literate image practitioners in this country- it is a huge challenge, affecting their business and livelihood. The following case sheds light on such a scenario.

Case 1: Alam (pseudo name) is a 28-year-old self-trained image practitioner, who works at a small printing shop near the popular second-hand book market at Nilkhet neighborhood in Dhaka. It is an 8-foot by 12-foot small shop with two wide-format printers, three small copier machines, and two desktops. The shop designs and prints small banners, leaflets, visiting cards, invitation cards, book covers, etc. Alam initially learned how to use graphical image-making applications like Adobe Photoshop, Illustrator, and Auto-CAD from one of his friends, who worked in a nearby shop. Later, he improved his skills by watching Bangla tutorials on these applications available on YouTube. Alam studied up to grade five and left school for work in order to support his family. Hence, he is not proficient in English. He memorizes all the icons of the software applications to execute a command while creating illustrations. For posters and leaflets, clients provide him with the desired text on paper. He then types the text on his designed background image and composes the whole thing to generate the final graphic output. He needs to run several iterations for each project. Once the client approves, the selected illustrations go out for printing. He told us that he makes his biggest profit during the annual national book fair in February every year. He designs and prints ten book covers on average every year. When we asked him about the emerging GAI systems, he said,

> *" I learned about Midjourney from Facebook posts on my homepage. I was astonished to see the level of detail, colors, and light quality each image had in those posts. With my skills in Photoshop or Illustrator, I could never create such images. When I started trying Midjourney, unfortunately, I found it very challenging with my very limited English vocabulary. I know how to use different tools using the icons, and I use my imagination and ideas to compose various illustrations/images. For me, drawing is the perfect medium to express my thoughts. Due to my poor educational background, I cannot "describe" an image in texts - not even in Bangla (his native language)."*- Alam (pseudo name, male, 28-year-old self-trained image practitioner)

Alam fears losing his business at the upcoming national annual book fair. He thinks book writers and editors will use Midjourney-generated images for book covers. They can create images with text commands easily since they are good with texts, unlike Alam. They used to hire Alam for his drawing skills and low prices. Alam worries he cannot compete with 'free' Midjourney. Due to infrastructural challenges (expensive internet services, power blackouts, among others), improving his English writing from online sources also seems impractical for him. To survive, Alam has decided to "collect" prompts from the internet, mostly from Western content creators, and use those to generate images. He will skip the brainstorming with his clients. Such a situation points toward a gradual decline in creative ideas coming from marginal artists like Alam.

5.1.2 Lost in Translation:

Our participants, who did not have problems with English, mentioned another kind of limitation with text prompts of GAI systems. Prompting in English to generate images through GAI often fails to capture many rhetorics used in the Bangla language and cultural thoughts and thus limits contextual imagination in the ideation phase of image production. For instance, one of our participants, who is a renowned Bangladeshi artist and academician, mentioned,

> *"I think Midjourney, DALL.E, and other similar GAI systems will soon incorporate languages like Hindi, Bangla, Urdu, Arabic, etc. However, it will struggle to capture the metaphoric meaning/ understanding of a particular language. This will create two-fold problems. On one hand, prompting to create an image close to the artist's imagination will be difficult. On the other hand, the continuous creation of new metaphoric meanings of words/ sentences/ phrases in a particular language by a visual artist will be affected."*- Renowned Bangladeshi artist and academician.

This points toward losing depictions of many cultural nuances through text prompts while using GAI systems. The following case elaborates on this aspect.

Case 2: Syed (pseudo name, male, 28-year-old painter, graphic designer) was trying to make an image of a local woman walking along the walkway on a rainy evening in Dhaka using Midjourney. When he was writing the prompt, he started to think about what words could better express the quality of rain Dhaka often experiences. At first, he thought about a Bangla word *"jhiri jhiri"*, an adjective to explain a certain kind of rain with a particular kind of wind, which is very common in Bangladesh. Then, he tried to translate the word into English. He tried the words *"drizzle", "misty", "spitting",* and *"sprinkle"*, among others. However, these texts misrepresented the rain he had in his imagination. He said,

> *" ...there's a limitation of texts. Texts are often static, and imaginations are dynamic. If I tell five Bangladeshi artists to make an illustration of "jhiri jhri" rain, manual or digital, they will come up with five different versions of the same kind of rain. However, they will always term it as "jhiri jhiri" rain in text. So, one text can provoke many imagined versions of it for illustration. Moreover, some artists may attach "jhiri jhiri" rain with their own cultural experiences, and ideate a metaphoric situation to provoke certain emotions, such as happiness or sadness, among the local audience...."* - Syed (pseudo name, male, 28-year-old painter, graphic designer)

According to Syed, all the above-mentioned nuances associated with the ideation of an image are difficult to express in text. Hence, text-based prompts could not support his imagination, and his ideas were lost in translations. To catch up with the ongoing hype on social media around AI images, he *"let his original idea go and made peace with whatever images Midjourney generated"*, and shared those on his page. The popularity of those posts on social media made him even more nervous about losing many Bangla cultural components and associated feelings that GAI cannot capture through text.

5.1.3 Dazed by Acceleration: Our participants mentioned that GAI systems save time in the process of image production. For instance, one of our participants, who is a final-year student at an architecture school, mentions that GAI can produce realistic rendered images for architectural illustrations with beautiful lighting conditions and textures. With other software applications, she usually spends hours and even switches applications to achieve that level of detail. In one of our FGDs, participants discussed how this speed of GAI opened up opportunities to accelerate commercial works, ranging from designing book covers to creating visual advertisements to rendering realistic architectural images. *"More work and more money in less time- that is the motto of AI"*- opined one of our participants in that FGD. However, they also mentioned that once the market and the consumers get used to this new speed, it will be difficult to slow it down. To catch the market speed and survive the competition, image practitioners will sacrifice clarity in thinking, thorough background study, language study, and fact-checking (where necessary) required for generating rich prompts. Their ideation phase will suffer, which, in turn, will develop 'fancy but images with poor ideas', creating confusion or spreading misinformation. The following case explains such a scenario.

Case 3: Badal (pseudo name, self-taught graphic designer, male, 26-year-old) started to learn Midjourney by watching videos on YouTube. He joined several popular Facebook groups for Midjouney users in Bangladesh. People showcase their GAI-produced images in those groups. Badal's posts gained immense popularity, and he started to receive tons of requests for commercial work - from making souvenirs to producing illustrations for books to designing political banners. However, none of his clients were ready to wait even a week. Badal says,

> *"They want immediate delivery, or they will go to another artist on the Facebook group, and I will lose money. Hence, I hardly have time to think thoroughly while writing prompts. I copy and paste prompts I find from various international sources via YouTube or Reels. Even for the book illustrations, I do not get time to read the book and develop ideas for illustrations as I used to do before. I have now started asking the writer to give me some keywords from the book. I put those keywords as a part of the prompts and generate images using Midjourney and Stable Diffusion. I know this is not helping me create original, thoughtful works, but I do not want to fall behind in this new commercial art market momentum."* - Badal (pseudo name, self-taught graphic designer, male, 26-year-old)

Badal's case indicates that GAI systems are speeding up the image production time. To stay in the competition, commercial image practitioners are cutting time from the ideation phase. Dependency on "others' imagination" (mostly Western) [87] through readily available prompts is rising. This, in turn, often produces images that neither represent the imaginations of Bangladeshi artists nor capture the emotions attached to the subject matter (for instance, a book, or a souvenir made for a family member).

The above-mentioned cases present a perplexed ideation process backed by GAI applications by our participants. These cases also surface the inevitable risks of marginalizing creative ideas from low-literate artists and significant linguistic metaphors. A GAI-induced accelerated market economy is replacing the original thinking practices of Bangladeshi image practitioners with text-based prompts available online.

5.2 Deformed Illustration

Next, we turn to surface how GAI systems are causing image-based deformations of socio-cultural components in the illustration phase of image production, which comes after ideation. In this phase, image practitioners primarily use software applications such as Adobe Photoshop, Adobe Illustrator, Corel Draw, Corel Painter, AutoCAD, Rhino, and SketchUp, among others, to illustrate their ideas on a computer screen. Our participants reported having almost full control over the illustrations they produce using these applications. However, with the advanced GAI systems, this illustration phase has transformed into a *collaboration with AI"* for them. The voice of the image practitioners is expressed through the prompts as the input, and the voice of the AI is derived from some "unseen" large collection of 'data' - available on the internet. Nevertheless, the training data of the AI models, lacking sufficient cultural representation and containing inherent internet biases against the

non-English Global South places and cultures, often negatively affect this illustration phase. Consequently, the generated outputs compromise the image practitioner's cultural identity and distort the contextual representation in the produced images.The following paragraphs elaborate more on GAI-induced challenges:

5.2.1 Exclusion:

In the Western world, disciplines teaching spatial design, such as Architecture and Urban Planning/Design, are experiencing an ever-increasing dependency on data [27, 47, 75]. From program generation to functional analysis to climatic prediction to user experiences- the design of built environments is going through revolutionary changes with the evolution of big data [29, 31, 82, 131]. This phenomenon has inspired cities like Dhaka to incorporate data in their spatial design systems. *"Appropriate application of data in Urban planning can minimize potential design-related "mistakes" in the future"*- says one of our participants (an academician and architect). However, architects and urban planners/designers here often struggle to incorporate new data-based technologies in their design process due to a data shortage to feed these systems. For instance, one of our participants had to abandon GAI tools, and she designed urban washroom facilities for local women using her own cultural and contextual backgrounds to comprehend their necessities as representing data was not available.

Our participants, architects and urban designers, reveal how insufficient data in GAI-produced architectural illustrations can exclude various social groups from design decisions. They foresee GAI being widely used in two stages of spatial design. First, GAI will enable designers to generate iterative illustrations of their initial design ideas. For example, an architect designing a school can prompt the functional requirements, context, and material options, and get quick images of different design options. This can help her evaluate each option and proceed to the next phase of detail designing with more clarity. Furthermore, GAI can help conduct a quantitative background analysis of a project Our participant, a faculty member from a renowned architecture school, mentioned,

> *"...background studies, site surveys, statistical data, building codes, historical references, and climatic condition-related data can be extracted quickly through AI tools. Mostly, it will help in the skill-based or knowledge-based sectors... Co-relation and patterns among these data can also be extracted using AI algorithms. Predictive models and their visual representations (images) can be built with this data."*— Faculty Member, X Architecture School, Dhaka

Second, GAI can save the time needed to render images of the final design output of an architectural project (e.g., a future residence or office building). In such cases, appropriate prompting in the ideation phase is essential. However, what GAI systems will develop in the illustration phase primarily depends on the availability of data on the internet. Due to socio-cultural, political, and/or religious reasons, many social groups in Bangladesh do not have proper representation in the online world (or in public, in general). For instance, Bangladeshi women, indigenous populations, transgender communities, and older adults, among others. Hence, when GAI systems try to generate images based on the data available online, the exclusion of these groups in the GAI-generated images becomes inevitable. While previous studies have mentioned the "risk of exclusion" in generative text-to-image models [32], our participants elaborated on exclusions of marginal voices and their necessities in the design, conceptualization, and visualization of the future in architecture and urban scenarios of postcolonial context like Bangladesh. One of our participants mentions,

> *".. our students are fascinated to see (with GAI's help) how easily they can create drawings or representational images of buildings/spaces that look like the trendy architectural drawings from the Western world. Soon, GAI is going to be essential to produce quality work in a limited time. However, since we do not have an inclusive local database for the GAI models to train with, students will unknowingly exclude critical cultural components of our context and marginalized communities from their design exercises."* – Faculty Member, Y Architecture School, Dhaka

We came across a reference image from another participant, which exemplifies the apprehension mentioned above. She was analyzing the spatial narratives that GAI can generate through images around the informal markets in Dhaka. The images Midjourney produced had some visual similarities with Dhaka's informal markets. However, the images did not have any single women in them, which is both a misrepresentation and a problematic portrayal of the future of Dhaka's urban spaces.

5.2.2 Distortion:

In addition to the exclusion of various social groups, the unavailability of local data and imperfect image-data pairing lead to distortions in Bangladeshi contextual visualizations in GAI-produced images, even if the prompts are written clearly.

Case 4: Aparajita, (pseudo name, female, 29-year-old, graduate student studying Architecture, digital artist) wanted to create visual representations of one of the Dhaka marketplaces- *Gawsia Market* for her thesis proposals. This market is primarily dedicated to serving low to middle-income urban women with products ranging from cosmetics to ornaments to clothing. Using Midjourney and Disco Diffusion algorithms, she wanted to envision and communicate how this market might evolve in the future, keeping its gendered role in urban Dhaka. She encountered several challenges during the illustration phase of this process. She mentioned,

> *" GAI programs often produced generic images when given the geographical context of Asia or the Global South, particularly without explicit color scheme instructions, resulting in an unwanted sepia tone or monochrome image. Another problem is although I mentioned Dhaka and Bangladesh in my prompts, the buildings and dresses of the people looked either Indian or African... I think, in the context of South East Asia, relying solely on prompt writing, without reference images/data, is ineffective."*— Aparajita, (pseudo name, female, 29-year-old, graduate student, digital artist)

Aparajita also participated in an FGD, where she shared her work with the rest of the participants. Shwaran (pseudo name, 32 yrs old, male), a freelance visual artist, whose Midjourney works gained

Figure 4: Midjourney images, prompted to analyze spatial conditions in an informal market in Dhaka. The generated images excluded women from the scenarios, which misrepresented the context since Dhaka women actively engage with informal market systems both as buyers and sellers.

immense popularity on Bangladeshi social media, shared similar problems with us. He mentioned,

> *"I have created a series of futuristic images of Dhaka city using Midjourney. However, the images never looked like Dhaka. Rather, they looked like some dystopian sci-fi movie scenes from Hollywood, portraying poor parts of a future unnamed city. Most interestingly, one of the images demonstrated a dead Dhaka city with thousands of crosses (the principal symbol of the Christian religion), while this is a Muslim-majority country. When I posted that image on social media, angry comments started to appear for misrepresenting the city's future. Eventually, I had to remove the post from social media to avoid any religious conflict."* — Shwaran (pseudo name, 32 yrs old, male, freelance visual artist)

This and similar cases from our study show how poor online representation of Global South countries like Bangladesh results in distorted images through GAI. Such distortions, on the one hand, misrepresent the local contexts of these countries to the outside world since hyper-realistic images from GAI systems can be easily mistaken for real ones. On the other hand, such images can cause socio-cultural controversies among people with low digital literacy.

5.2.3 Extinction:

GAI systems and their images threaten many local styles, genres, skills, crafts, and methods of architecture and art. Infrastructural constraints (e.g., unequal internet access and cost, unclear copyright systems, complex and expensive digital documentation, web development, and online data storage) prevent local creative professionals from showcasing their works online. This results in a low online presence of Bangladeshi architecture, art, crafts, and skills. Thus, text-prompt-based GAI often generates images that misrepresent Bangladeshi architecture and visual art. This may lead to a loss of traditional styles and local diversity in art and architecture, as GAI becomes more popular and widely used by the young generation.

Case 5: Ridita (pseudo name, 26-year-old female) is an architect from Bangladesh and knowledgeable about how the modernist thoughts of the West met the Bangladeshi context, and architects here (like Mazharul Islam, Bashirul Haq, Kashef Mahboob Chowdhury, Rafiq Azam, and Marina Tabassum, among others) brilliantly introduced those thoughts without sacrificing local ideologies, cultural behavior, and materiality. When she moved to the US for higher studies, she found that her international classmates were not familiar with many of the Bangladeshi architects' works since these works are not *"as easily available as the architects from the Global North on the internet."* She experienced such phenomenon more vividly when she started using Midjourney and Stable Diffusion. She says,

> *"...I studied Bangladeshi architect Bashirul Haq's work thoroughly. Hence, I could provide a very detailed prompt on Midjourney. My intention was to generate a building that would express the architectural features, materiality, and philosophy of Haq. However, Midjourney produced images of buildings that had no connection with Bashirul Haq's work. Instead, the buildings looked like a weird collage of bits and pieces from Indian architecture from different time periods. I could understand the difference between Haq's work and that Midjourney image. But imagine if one of my international classmates did a similar exercise. Without even knowing Bashirul Haq, they will get an extremely wrong idea about his work."*

Ridita did a second exercise. This time, she prompted GAI to generate images for a building that would represent the architectural style of Zaha Hadid, the globally famous Iraqi-British architect. Images that Midjourney produced depicted buildings that portrayed Hadid's architectural style quite accurately.

With Ridita's permission, we shared both sets of these images (a few of those are presented in Fig. 6) in one of our FGDs and asked the participants to share their thoughts on GAI's production. One of the participants mentioned,

Figure 5: (a) Photo of Gawsia Market (b) a future version of Gawsia market envisioned by Midjourney, which doesn't match Dhaka's architectural/ spatial characteristics, rather presents a weird mixture of Indian and Middle-Eastern ambiance. (c) and (d) showing women in Dhaka market area, who do not look like Bangladeshi women.

> *"... such misrepresentations of the work of local architects or artists will marginalize their intelligence and endeavors in the online image world. If GAI keeps using whatever is popularly available on the internet, extremely valuable yet rarely shared work like Haq's may gradually disappear from the online world. Future Bangladeshi architects might blindly follow contextually and culturally inappropriate yet virtually dominating architectural styles."* – Tamanna (pseudo name, 34 years old, female, practicing architect)

Our social media study showed that GAI-induced new images replicated the painting styles of famous Western painters like Van Gogh, Picasso, or Escher, but rarely those of artists from the Global South. This phenomenon threatens the survival of many art and architectural styles and philosophies from the Global South in the world of images. It also limits local artists from creating new genres, as dominant nonnative trends overshadow them. Thus, GAI-induced images exclude, distort, and extinguish less "popular" contexts, cultures, and creative practices of the Global South countries like Bangladesh and promote image-mediated colonization.

5.3 Intricate Exhibition

Finally, we document the social intricacies that the GAI image-making systems are producing in the exhibition phase. Image practitioners usually exhibit/share/publish their work with general audiences after the images are created. In Bangladesh, GAI images pose various contextual issues and concerns in this phase, along with the worldwide ongoing conversations around ownership and copyright issues [17, 91, 152]. The challenges in the ideation and illustration phases are faced by the image practitioners alone, but the exhibition phase involves a wider audience, adding more complexities. The subsequent paragraphs present cases that document some of those issues.

5.3.1 Resistance:

Images developed through GAI and shared on social media, often fuel sociocultural resistance among the audience. Such situations push image practitioners to question the idea that GAI is "just a tool" that generates images with more details in less time. The following case explains such a scenario.

Case 6: One of the most popular genres of GAI images on Bangladeshi Facebook groups includes fake images of film stars from home or abroad. GAI images showing Hollywood film stars having a hard time during a Bangladeshi natural disaster or selling cattle at a local market, for example, were shared countless times on Social Media. Even TV channels made features on GAI images that brought back Bangladeshi film actresses from the 60s, 70s, and 80s in modern-day attire and make-up. In a similar spirit, a very popular image practitioner made an announcement on Facebook about bringing back Salman Shah, a demised Bangladeshi actor through AI, who still is one of the most admired "heroes" in Bangladeshi film history, along with a sample GAI-generate photo of him. The post immediately received the attention of millions of Bangladeshi Facebook users. Everyone was waiting to see their favorite hero through the eyes of AI, who was only 24 years old when he died in 1996. However, the actor's family reached out to that image practitioner soon and requested him not to "bring back" the actor due to religious reasons. Consequently, the image practitioner posted the following paragraphs publicly on Facebook (published on, September 1, 2023)

> *"Salman Shah's picture (GAI image) has been taken down following a request from Salman Shah's family. Neela Aunty, Salman Shah's mother, reached out to me, urging the removal of the image due to its religious significance. She also requested that everyone have Salman in their prayers. Mother's wish is the most important. So, in accordance with her wishes, I removed the picture, and I want to tell everyone that the remaining pictures will not be published...(continues)"*

This post sparked debates among the Bangladeshi netizens. Some questioned Salman's family's request when his movies were on YouTube. Some praised the image practitioner's empathy for Salman's mother's request. Some objected to "bringing back" a dead person through AI as unethical. Some claimed that "bringing back" Salman meant reincarnation, which contradicted Islamic philosophy (Salman Shah was a Muslim). Such GAI images faced

Figure 6: This set of images demonstrates GAI's limitation in following and illustrating the architectural features and style of a prominent Bangladeshi architect, while it could replicate the same for the London-based Zaha Hadid Architects. (a) Dominion Office Building, designed by Zaha Hadid Architects, completed in 2015, Image Courtesy: Slate [14] (b) An imaginary building highlighting Zaha Hadid's architectural style in Midjourney. (c) Chhayanaut Shangskriti-Bhavan, designed by Bangladeshi Architect Bashirul Haq, completed in 2006. Image Courtesy: The Business Standard [4] (d) An imaginary building highlighting Bashirul Haq's architectural style in Midjourney.

social resistance in the exhibition phase due to cultural and religious beliefs. This situation showed the need for dialogues among religious communities about AI images and videos, as Islam had some restrictions on photos and videos [61]

5.3.2 Revolution:

Digital or not, illustrated images and their public exhibitions have always played a vital role in promoting marginalized voices, initiating protests, or sparking revolutions. Brilliantly composed images are considered to be one of the strongest mediums to reach the mass population and gain social momentum. For instance, during the liberation war of Bangladesh, Artist Kamrul Hasan illustrated a poster that depicted a monstrous face of Pakistani President General Yahya Khan, who ordered genocide in Bangladesh [9]. With the writing "Annihilate these Demons", this widely-spread poster inspired the Bangladeshi freedom fighters. Such illustrations need a lot of thought, courage, observation power, and a sense of social responsibility in an artist. Now, the emerging GAI systems are offering tools and techniques with the idea that anyone can be an "artist". On the one hand, these tools can help those who have creative thoughts but lack the skills to produce artistic images. On the other hand, GAI systems are challenging the training process of those artists who actually have the capability to reform social norms. One of our participants, a faculty member at a reputed fine arts school, mentioned an increasing lack of interest in "observation" as a skill required for making artwork among the students.

> *"To be honest, at first, I found it (GAI) really interesting, such as witnessing the AI-generated output that seamlessly combined various artistic concepts. However, as time went on, a concern arose when we noticed some students excessively relying on Midjourney for their submissions. This can negatively impact their capacity for observing the world surrounding them and generating independent creative ideas, which is quite concerning."*— Faculty Member, Fine Arts Institute, X University, Dhaka.

Another participant also mentioned that GAI can create a future generation of artists (now students) without strong observational and critical thinking abilities. This, in turn, can threaten the growth of young artists as revolutionary thinkers and influencers, which is the second problem GAI inducing. He says,

> *"Art is inherently tied to people and social dynamics. Throughout history, it has played a vital role in numerous social revolutions and human evolution. If AI hampers artists' observational skills and creative thinking...it can lead to dangerous consequences. New artists may be totally ignorant about their actual role in society. Additionally, there's a risk that if AI alters people's perception of art and enables everyone to create art without truly being an artist who works for society, it might inadvertently drive negative activities rather than promoting art for peace and positive change."*— Faculty Member, Liberal and Fine Arts Institute, Y University, Dhaka.

The subsections above explain how, in the exhibition phase, GAI-induced images are raising concerns around the consumption of image practitioners' works. On the one hand, GAI images are often forming new queries associated with cultural and/or religious beliefs. Such situations complicate an image practitioner's ethical position around the generated image since the image is produced as a collaborative project with GAI. On the other hand, such collaborations often hinder image practitioners' voices in bringing positive social changes.

6 DISCUSSION

In the sections above, we documented a selected set of cases and quotes from our fieldwork that demonstrated how the emerging GAI systems have started to impact digital image production and

Figure 7: (a) Public announcement of "bringing back" demised film star Salman Shah by using GAI. (b) Public announcement of taking down Salman's GAI-generated picture due to religious significance. (c) Screenshot of fans' post showing resistance toward GAI's "power" in bringing back their favorite hero.

consumption in Bangladesh. Our findings highlight how GAI limits idea generation, produces distorted and misrepresenting illustrations, and excludes cultural nuances and marginal social groups from local image-making processes. We have further reported how GAI-produced images have started to develop various socio-cultural resistances and spark new queries in religious understanding around images. We have also shed light on how GAI oftentimes limits the spirit of young image practitioners to explore the power of images in bringing positive changes in society. Our study generates several important and interesting immediate design implications, along with some broader lessons for HCI scholarship.

6.1 What Designs Can Do

First, we turn to the design inspiration that we gather from our study. Our study shows that language barriers often make generative AI tools inaccessible to image practitioners in the Global South. Additionally, the difficulties in translating cultural nuances into English add an additional layer of challenge for the local practitioners. HCI4D literature has long highlighted how English interfaces have created obstacles in appropriating computing technologies in the Global South (see [71], for example). Several design interventions have been proposed to provide culturally appropriate interfaces for computing systems in the Global South [137, 147, 147]. However, we argue that to make generative AI accessible for the people in the Global South, the design needs to go deeper than the interface, and needs to address the inner functioning of the data-driven algorithms that produce the output. For this, a local database of image and corresponding texts need to be developed to train the system, which could be done through a local development of GAI tools. Instead of trying to map the closest English translation for Bangla words, for example, the system needs to associate Bangladeshi images with Bangla words for it to function better. At the same time, we believe that there should be more facilities for Bangladeshi aspiring practitioners to learn these technologies. Our participants complained about the paucity of online Bangla content for learning GAI. We believe that more local content should be developed to address these needs.

Second, our study shows that many of the challenges that Bangladeshi practitioners experience while using GAI tools come from the lack of substantial and positive representation of Bangladeshi content online. We argue that, while part of this problem was created due to the weak computational infrastructure that Bangladesh has, a big portion of this problem was also created by the way Bangladesh was represented by the Westerners with stronger computational power. For a long time, most online photos of Bangladesh were captured and posted online either by people from other richer countries or by the smaller, richer population of the country who got a Western education [68]. As a result, any image search with terms like "Bangladesh" or "rural Bangladesh" would gather pictures of Bangladesh and Bangladeshi people affected by poverty, floods, earthquakes, and political unrest for many years. Similarly, searches with terms like "poor people," "hunger," "disaster," "illiteracy," and many other negative terms would produce a list of images with a strong presence of Bangladeshi people [87, 142]. While the situation can be connected with the existing critical work on stereotyping in text-to-image models [30, 52, 134, 153], the design approach toward "solving" such problems needs to go beyond the existing generalized versions of design solutions (such as, [53, 97, 144, 151]). We argue that the design of GAI algorithms should take contextual alternative

narratives into consideration while producing images related to a country in the Global South [50]. For instance, images of natural disasters in Bangladesh should also portray the power of resilience that Bangladeshi people demonstrate in rebuilding their lives and surroundings after a disaster. We argue that historical biases should be addressed at the design level, either by accounting for the statistical sampling in the data and sentiment analysis over the associated texts or by compensating for any negative portrayal by allowing human-in-the-loop interventions while producing the output [94, 109, 149]. At the same time, AI models should be trained to accommodate context-based alternative narratives associated with particular texts.

6.2 Repairing the Colonial Damages

Beyond these immediate design implications, our study generates a number of broader lessons for HCI. Our findings demonstrate how the GAI tools can colonize the imagination of the art practitioners in the Global South, which directly contributes to the growing literature around postcolonial computing in HCI [21, 67, 87, 100]. Existing rich literature on data colonialism mostly focuses on the extraction, biases, and surveillance aspects of AI technologies [24, 44]. While Generative AI shares the basic principles of AI models, and hence all colonial criticisms of AI hold for these Generative models. We argue that the latter can have a more damaging effect because of their power and popularity. For instance, our fieldwork revealed an immense popularity of GAI-induced futuristic images of Dhaka city on social media that portrayed Dhaka as a failed, devastated city from Hollywood movies. Such images (shared a million times) have the power to actively shape and reshape future hopes, aspirations, and anticipations the citizens have for their beloved city. Similar cases from our findings exemplify a colonial effect when data extraction is not possible (figs 3 and 4).

Here, we note that colonialism is not a metaphor [133], and any colonial argument needs to be grounded in the relationship between the land and its people. We argue that this fundamental relationship is affected by the way generative AI tools portray the land and people of Bangladesh both to the citizens and to the foreigners. A distorted and Westernized picture of local places not only conveys wrong information about the land but also inspires people to bring changes to the land in a Western direction. Global South countries that fail to produce enough local data are hence vulnerable to such generative AI technologies that impose a "Western gaze" [28] upon local data, and (re)produce Western imaginaries [87, 129] for the future of the land, extending a colonial approach. To qualitatively measure such GAI-induced colonial damages, we provide the ethnographic details of the work of design practitioners in Bangladesh, following the rich tradition of ethnomethodological studies of workplaces in HCI, CSCW, and related fields (see [69, 107], for details). Such ethnomethodological studies reveal the important nuances of how humans interact with technologies in their work [20, 38, 127], and these findings inspire future HCI researchers to design, develop, and/or improve technologies to address the challenges [106]. From this perspective, this paper presents a completely novel set of findings on how design practitioners interact with the generative AI technologies, and how the broader narrative of data colonialism is embedded in that interaction. So, this paper presents to the HCI scholarship the necessary nuances of the impact of AI/data colonialism that inspire actionable outcomes (design and/or policy implications).

6.3 Generative AI and the Others

Here, we discuss the significance of our paper's findings that are associated with sexism, religion, and creativity, which may not appear to be in tandem with this paper's overall argument surrounding the colonial nature of AI. In doing so, first, we explain how our findings are different from the existing findings of AI being racist and sexist [42, 155]. Or, how these issues connect to the Global South condition. Our work builds on the rich tradition of postcolonial feminism, postsecularism, and knowledge decolonization literature, which argues that the nature of these problems in the Global South (especially in the countries that have a colonial history) is heavily affected by colonialism. For example, the study of Indian feminism shows how Indian women are not only the victims of patriarchy but also of the colonial [90]. Recent HCI work on Intersectional HCI [116] further advances the necessity of situating these problems in the history and identity of the subjects to approach those. Our findings of the elimination of women from the Bangladeshi marketplaces, for example, should be seen not only from a mere perspective of patriarchal hegemony but also from a colonial perspective. Generative AI's lack of knowledge about Bangladeshi women should be attributed to the historical negligence toward the knowledge of the Global South [79].

Next, our data also shows how generative AI accelerates the art production processes, challenging marginal artists and design thinkers. This aspect of generative AI connects itself, along with many other computing ventures, to the mandates of productivity and modernization, which many scholars in HCI and related fields have been critical of [86, 111, 124]. Similar to Gregg's critical findings on productivity [56], our case studies showed that marginal image practitioners faced stress from both the risk of losing their work and the demand to produce more work in less time, due to the ever-increasing popularity of generative AI tools in the country. HCI scholars have long argued how different forms of technology, such as clocks, calendars, computers, and smartphones, affect the perception, organization, and experience of time in various domains of life, such as work, leisure, family, and culture [143, 145]. We argue that generative AI contributes to this process of acceleration of society, which, in turn, devalues slow and aesthetic forms of life, including art and culture. Our paper calls for further examination of such AI-driven acceleration of society and its impact on postcolonial art and culture.

Finally, we would also like to highlight the contrast between the faith and generative AI that surfaced in our study. Generative AI produces artificial images, which are fake. While an artist is not bound to produce artwork that represents the shared reality with their community, they are morally accountable to society. This is where generative AI differs from human artists, as it is not morally accountable to society. This tension becomes severe in many places in the Global South where, unlike the secular West, religion, faith, and spirituality hold the moral structure of the society [85, 110, 124, 126]. As we saw in our findings, the AI-generated images of a dead movie actor were not approved by a part of society, while

the digital images and videos of the same person stored online did not bother them. Any hand-drawn portrait (digitally or on paper) of that person was also acceptable to them, which leads to the question - what are the fundamental aspects of AI-generated images that challenge their moral system? We argue that the ability of AI-generated images to be closer to reality triggers this part of the community. Also, AI's ability to make the dead person do anything scared them. As Sultana and Ahmed said in their paper on witchcraft and HCI, such computational features fundamentally challenge many assumptions of religions that attribute these qualities to God [124]. Hence, generative AI runs the risk of threatening the religious belief systems of many people in the non-secular Global South countries.

By surfacing all these socio-cultural nuances, our paper makes important contributions to various branches of postcolonial HCI, including feminist and faith-based HCI from the Global South [62, 112, 124, 125]. We argue that it is important to conceptualize the impact of Generative AI through the marginalization in each of these veins of postcolonial computing.

7 LIMITATIONS AND CONCLUSIONS

We note that our study is situated in Dhaka, Bangladesh, and focused on the image practitioners, who are Dhaka-based. The rural parts of Bangladesh have a wide range of image practitioners. Our study does not cover how rural image practitioners are exposed to digital image-making processes and how GAI is going to impact their work. We also studied only those image practitioners, who work on digital mediums. This excludes others who are involved in manual image production, like painting, rickshaw painting, banner writing, backdrop painting, hand-printing, etc. Following the tradition of qualitative and ethnographic work, none of our findings should be extended beyond the studied context. Here in this paper, we consider Bangladesh as a postcolonial country that has a long colonial history [136]. Previous studies in HCI [21, 86, 124] and elsewhere [60, 66] demonstrate that much of Bangladesh's modernization processes, including the use of technologies [77, 88], are affected by its colonial past. Furthermore, we also conceptualize Bangladesh as a country in the Global South, that is often "othered" by the rich and powerful Western world [87]. The technological "development" of Bangladesh, as several studies show, is shaped by this power dynamics. Hence, we put the findings of this paper as discovered facts in a postcolonial Global South country. Following the long and rich tradition of similar ethnographic work in Bangladesh [21, 124], India [78, 104, 105], Pakistan [63, 64], and many such Global South countries, we maintain that (a) the findings here are not generalizable to all Global South countries but should be taken as evidence of the historical and ongoing marginalization of the Global South as a body [39], and (b) the evidences of marginalization in one region should inspire to find the same or similar findings in other regions to strengthen the solidarity among the Global South countries [40]. Such deep sensibilities around the solidarity of the Global South countries 'across the borders' [76] is important to advance HCI's broader commitment to the decolonization of knowledge and upholding human dignity all around the world [41].

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