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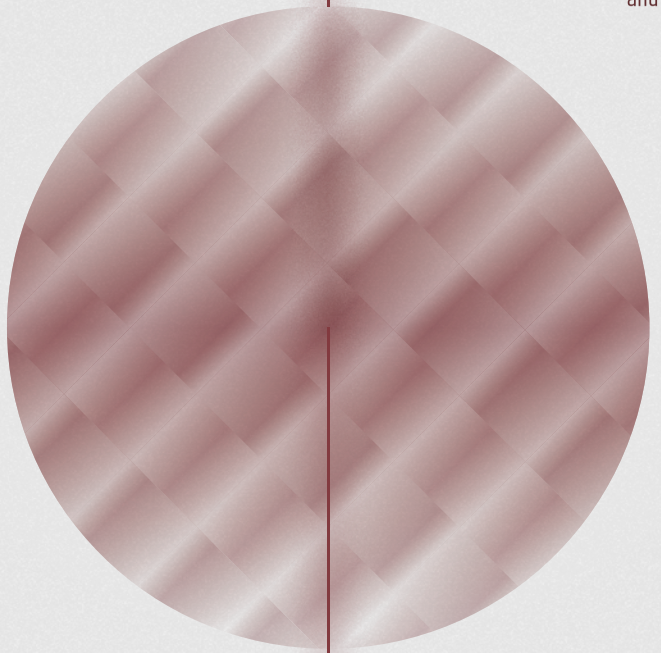
scientific magazine on graphic design
and new media



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#graphic design #new media #visual culture #ethical design

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Dear Readers!

The ninth issue of dsignn is devoted to the relationships between tradition and technology, nature and algorithm, as well as to the ethical dimensions of contemporary design. The articles gathered in this issue reveal the complexity of current research and design practices situated at the intersection of graphic design, new media, visual culture, and digital tools.

The published texts address questions related both to the cultural sources of visual communication and to the use of artificial intelligence, biomimicry, and generative methods in design processes. An important place is also given to analyses concerning image, form, and code as structures that organize contemporary ways of representing, interpreting, and modeling reality. These considerations are complemented by the issue of ethical design of digital experiences, with particular emphasis on responsibility toward the user.

The issue we place in the hands of our Readers presents design as a multidimensional field, developing between research, experimentation, creative practice, and reflection on the social consequences of design activity. We hope that the texts presented here will become an impulse for further research and discussion on the transformations of contemporary graphic design, new media, and visual culture.

Enjoy reading!

Dsignn Editorial Team

Contents

C-IDEA PhD Forum (2/3)

The first International Phd Forum organized by the C-IDEA Association was successfully held from 22 to 24 October in a hybrid format, with simultaneous sessions hosted at Miami Ad School Berlin, Germany, and Shih Chien University (Kaohsiung Campus) in Taiwan, China. The event was co-organized by the C-IDEA Association, the Australian Research Centre for Virtual and Interactive Environment (IVE), and the Polish academic journal dsignn, attracting active participation from scholars and researchers across the globe.

The forum was co-chaired by **David Blaiklock**, **Li Xu**, and **Chang Fangpang**. An esteemed international review panel, comprising eight experts, provided academic evaluation and guidance. The panel included **Prof. Ning Gu** (Adelaide University), **Prof. Robert Jundo** (Strzeminski Academy of Fine Arts in Łódź, Poland), **Prof. Hyungjoo A. Kim** (Purdue University, USA), **Prof. Andreas Ken Lanig** (Head of Design and Media Department, Nordhessen University of Applied Sciences, Germany), **Prof. Lisa Winstanley** (Nanyang Technological University, Singapore), **Prof. Jiang Jie** (Nanjing University of the Arts, China), **Prof. Anna Rita Emili** (School of Architecture and Design "E. Vittoria", University of Camerino, Italy), and **Dr. Anna Kłos** (Director, WIT & Retroavangarda Gallery, Poland).

Prof. Ning Gu of the Adelaide University served as the Forum Chair. Distinguished guests, including C-IDEA Association President David Blaiklock and University of South Australia's Dan Mclean, contributed as commentators, providing valuable feedback on the presentations.

The forum brought together doctoral candidates and early-career researchers from 15 institutions across seven countries, including China, Slovenia, Georgia, and Serbia, who presented their research findings either online or on-site. The presented papers centered around three cutting-edge areas:

- **Technology and Tradition:** Research demonstrated the application of digital tools like AI image generation and cellular automata algorithms to analyze historical elements such as Ming dynasty clothing symbols and street art, establishing methodological frameworks for the visual reconstruction of cultural semantics.

- **Social Innovation:** Studies focused on design empowerment, exploring co-design approaches to foster rural revitalization by strengthening farmer agency and developing ethical UX frameworks tailored for early-career craft practitioners.

- **Cultural Identity:** Explorations in this domain were multifaceted, ranging from constructing urban imagery for the Hangzhou Asian Games to comparative analyses of Eastern and Western narrative paradigms, thereby deepening the philosophical discourse on local design identity within a globalized context.

Since its establishment in 2018, the C-IDEA International Alliance of Art and Design Universities & Educators has grown into a significant international association, now comprising 147 member institutions from over 35 countries, including many of the world's leading art and design colleges. Operating as a non-profit organization, C-IDEA is dedicated to fostering exchange and collaboration in teaching, research, and practice among international design institutions, actively contributing to the advancement of global design education. ■

REVIVING TRADITION

Influence of Patachitra Style in Advertising and Brand Storytelling

Arpita Pradhan, PhD

peer-reviewed conference materials

This article is based on the presentation delivered at the C-IDEA Design Conference, held on 23-26 October 2025 at Shih Chien University, Kaohsiung Campus, Taiwan, China.

#Patachitr # Kalighat Patachitra #Kalighat Painting #Pingla Patachitra #Advertising #Branding #Hyperlocal Marketing Strategy

Abstract

This study tries to explore how the unique visual identity and cultural significance of Patachitra make it an attractive option for brand promotion to connect with prospective buyers. This study also highlights how the narrative style of Patachitra can help brands to tell engaging stories and create an emotional connection with their target audience. Traditional folk styles are still significant for getting people interested in buying things in present times.

Communication is to convey any message to another. What we see and feel, generally we try to communicate to others with the help of various media. Before the birth of language, image was the key to expressing oneself to another. Since the period of cave paintings, pictures have been an important part of communication. Gradually, with the evaluation of language, the image emerged as a communication signifier. The use of this signifier makes the understanding of many complex theories easier.

Patachitra is one of the oldest traditions of image-based storytelling. It has been practiced in the eastern Indian states of Odisha and West Bengal as well as parts of Bangladesh [1]. Patachitra is basically based on stories from Hindu mythology, which were used in Hindu temples and rituals as well as storytelling scrolls. Today, it serves educational, commercial, and global creative purposes. Here, I am going to discuss the patachitra of West Bengal only. The discussion will be focused on two zones of West Bengal; one is Calcutta, now Kolkata, and the other one is West Medinipur.

The word 'Pat' derived from the Sanskrit word 'Patta' which means cloth, and 'Chitra' means picture [2]. Usually, patachitra was drawn on a piece of cloth that was coated with chalk mixed with earth and clay. Once the coating dried then paintings were made on it. Afterward, in the tradition of Pattachitra, paper was pasted over cloth as the base before painting. Broadly, Pattachitra can be categorized into two forms: one is the rectangular pat, which is known as a 'Choukas Pat' and another one is Scroll Pat which is also known as 'Jorano Pat' [3]. The artisans of Pattachitra are traditionally known as 'Patuas' and more respectfully addressed as 'Chitrakars' [4]. The image of patachitras plays a key role in communication to educate and entertain lower-class people in the rural area of West Bengal, India. The scroll pat is an old traditional method of image-based storytelling where stories are based on mythological

Fig. 1 Patachitra from Pingla, West Medinipur. Source: https://artsandculture.google.com/entity/g113s7wn3s?hl=hi.

stories like the Ramayana, Mahabharata, Purana, Mangal-kabya and others. It is like an infographic that lets you share knowledge with pictures, and everyone can understand it easily.

Between the 18th and 19th centuries, patachitra from Pingla of West Medinipur was known as Pingla Patachitra of West Bengal. In the 19th century, Kalighat Pat emerged as a popular folk art from Calcutta, now Kolkata, in West Bengal. Both patachitras have different styles and techniques.

Pingla, of the West Medinipur district of West Bengal, has been known as 'Pater Gram' (a village of making pat). Traditionally the patuas of Pingla were travelling artists and scroll pat painters. (Fig. 1) They visited place to place, singing songs (Pater Gaan) to narrate stories from the unfolded scroll Pat to the common people. The theme of the stories was mainly religious, mythical, epic, and folk. The main characteristic of this style was bold and linear outlines and a flat application of opaque colour, creating a two-dimensional effect and including a decorative border.

In between the late 19th century and early 20th century, the tradition of Pingla Pat declined due to the loss of rural patronage, mass production of prints, and the emerging market of Kalighat painting. Unfortunately, the Kalighat Pat itself also began to disappear in the early 20th century due to the popularity of the industrial print market. With the help of researchers, folklorists, and support of the government, Pingla Pat began to revive in the mid-20th century. Patuas of Pingla gradually started depicting societal issues apart from religious themes. The themes of Pat are like fighting against coronavirus, stopping child marriage, benefits of using sanitary pads, etc. They tried to incorporate urbanized lifestyle as their theme (Fig. 2).

Fig. 2 Pingla village, West Midnapur.
Source: https://www.tripadvisor.com/AttractionProductReview-g1024713-d20432340-Pingla_Village_of_the_scroll_painters-Kharagpur_West_Midnapore_District_West_Beng.html#/media/20432340/?type=ALL_INCLUDING_RESTRICTED&albumid=-1506&category=-150

Kalighat Pat, Kalighat Patachitra, or Kalighat Painting emerged on the riverbank of Buriganga (a canal diverging from the Ganges River) near Kalighat Temple [5]. A group of migrated Patuas from Medinipur and 24 Parganas of Bengal settled down here for their survival. Initially, they began performing vocal renditions of their long scroll painting to earn money, similar to what they did in their village. Gradually, Calcutta becomes a key destination for economic opportunities due to trading spots established by the British and Europeans. Simultaneously, the rural folk tradition of the pat painting adopted the urbanized environment. Patuas no longer had to travel to see audiences; now pilgrims came to them. At the same time, patuas were sellers, not performers. They began selling single paintings on a page in a vertical square shape.

n the middle of the 1800s, Kalighat pats became more popular as the growing railway network connected Calcutta to cities like Varanasi, Patna, Bombay, and Agra, as well as to the suburbs and interiors of Bengal. This brought more tourists, traders, and pilgrims to Calcutta [6].

> Kalighat, with its daily hordes of pilgrims, would have provided a perfect opportunity for the local artists to produce and sell small, cheap religious souvenirs. The patuas traditionally painted long narrative stories, often over 20 feet in length. Influenced by the different art forms around them and with a need to work quickly, the patuas abandoned their linear, narrative style in favour of single pictures involving one or two figures. The backgrounds were left plain, all non-essential details were removed, and basic combinations of colours were used. This created the key characteristics of the Kalighat genre. The patuas' productivity was also helped by the import of cheaper readymade paints from Britain and mill-made paper [7].

Shifting from cloth to paper helps make the Kalighat pat more accessible for all. The artists had also shifted from using gouache and tempera to watercolour. Flowing lines and rhythmic brushstrokes are the key characteristics of Kalighat pat. In this context, W. G. Archer (a British civil servant and art historian) emphasized Western influences in the Kalighat paintings, which are debatable. The shading of the Kalighat figure is not a European influence. It has been practiced since the Ajanta murals in India. Indian artisans do not follow the European style's single source of light. The shading of the Kalighat figure is not a European influence. It has been practiced since the Ajanta murals in India. The Ajanta Mural, the Rajasthan Mural, the Amritsar Mural, and the Nathdwar Patachitra of Rajasthan all have the same shading style. Transparent watercolours may influence Indian artisans, but they do not adopt the European style's single source of light [8].

The concept of Kalighat pat was based on religious themes such as Kali, Durga, Ganesh, Shiv, Laxmi, Saraswati, Jagatdhatri and others. These are all the gods and goddesses of the Hindu religion. Gradually the social scenario

Fig. 3 Babu and Bibi.
Source: https://blogvirasatehind.wordpress.com/2017/11/23/kalighat-patachitra-a-journey/

Fig. 4 Babu and Bibi.
Source: https://en.banglapedia.org/index.php/Kalighat_Painting

of 19th-century Calcutta became a part of the subject for Kalighat Pat. The depiction of social themes such as the babu culture of Calcutta gained significant popularity.

Babu was often used in colonial Bengal for educated, urbanised upper-middle-class and emerging middle-class men who were influenced by Western culture. Babu was a symbol of urban hypocrisy and moral decay. The key characteristics of being Babu were putting on European-style attire like coats, trousers, caps and boots; carrying a pocket watch or a walking stick, which are signs of prosperity and modernity; and flirting with women or being with a courtesan (Fig. 3, 4).

The word 'Bibi' means 'women.' In a deeper sense it denotes Bibi as a courtesan, mistress, or fashionable lady who believes in Western culture. She was often shown in European-influenced clothing or exquisite sarees with mirrors and jewellery, sometimes shown smoking a hookah, and sometimes shown with Babu (Fig. 5, 6). Parichand Mitra (Tekchand Thakur) in Alaler Gharer Dulal (1857), Kaliprassannya Singha in Hutum Pechar Naksha (1861) satirised the Babu culture of the 19th century in Calcutta in their Bengali writings. Both the writers did important work on social satire, where they depicted the middle class who wanted to be like British people but forgot about Indian values.

Fig. 5 Bibi fixing her hair, Kalighat Pat.

Fig. 6 A woman, probably a courtesan, smoking a hookah.

Source: https://www.wikiwand.com/en/articles/Kalighat_painting#/media/File:Kalighat_pictures_sep_sheets_7.jpg

The satirical representation of babu culture becomes a visual documentation of the socio-cultural situation of 19th-century Bengal. It can be called the realism of Bengal. Kalighat pat portrays the westernized, urbanized society of Calcutta life in a tangible way. The portrayal of Babu and Bibi in a variable serves as a powerful tool to boost Kalighat's popularity. The popularity of Babu and Bibi is still in vogue.

Kalighat painting is being done in rural West Bengal today. Medinipur and Birbhum are two places where modern painters have kept the tradition of Kalighat painting alive. They focus on secular themes and current events, as well as a blend of religious depictions, all done in a modern style [9]. Today, Pingla patuas also paint issues like health, gender equality, and social awareness, as well as global events.

Differences between Pingla and Kalighat Patachitra styles are shown in table (Tab. 1).

Kalighat paintings always play a catalyst to make a new horizon in colonial Bengal. It has multiple different layers to portray the identity of Bengal. The satirical version of Babu-Bibi presents two perspectives: the first highlights how we shifted away from our own values and formed a hybrid Bengali upper class by imitating Western lifestyles, mainly British. The second one is how the upper class was trying to create a new national identity by following and taking on parts of British culture.

The Kalighat painters remained anonymous. This art form came from the local village community of Patuas. The few names of Kalighat patuas that have been preserved — Nibaran Chandra Ghosh, Kali Charan Ghosh, and Kanai Lal Ghosh — are known mainly because W.G. Archer purchased work directly from these artists or their immediate descendants [10]. Many artists were inspired by the Kalighat pat style; one well-known

Tab. 1 Differences between Pingla and Kalighat Patachitra styles.

Aspect	Pingla Patachitra	Kalighat Patachitra
Origin	Rural tradition situated in Pingla (**West Medinipur, West Bengal**).	Urban tradition, situated in **Kalighat (Kolkata, 19th century)** near the famous Kali temple, Calcutta now Kolkata, West Bengal.
Medium	Scrolls (Pat) made of cloth with paper pasted, coated with Khari-mati (kind of clay), gum etc. Basically, Scroll Pat and later on include rectangular, Square Pat also.	Vertical Square Paper, with water colour and sometimes pencil outlines.
Colour	Natural pigments from organic/mineral sources. But now using synthetic colour also.	Water-based colours, sometimes imported pigments.
Style	Bold outlines, flat colours, multiple panels in narrative sequence.	Smooth, flowing brushwork, shading for volume, more individual figures than panels.
Theme	Religious epics (Ramayana, Mahabharata), folk tales, later on social messages, contemporary issues.	Religious images (Kali, Durga, Krishna), later also satirical depictions of Babu culture, social life, and colonial urban life of Calcutta now Kolkata.
Function	Used for storytelling with songs (Pater Gaan) in villages, Performing art. Now Made for urban patrons and pilgrims as souvenirs.	Made for urban patrons and pilgrims as souvenirs, affordable art.
Evolution	In between the late 19th century and early 20th century, it declined and revive gradually mid-20th century. Still performed as a living tradition, blending heritage with modern issues.	Declined by early 20th century, now studied as a historic folk-modern style from museums.

Source: own study.

Fig. 7 Patachitra from Pingla, West Medinipur.
Source: https://en.wikipedia.org/wiki/Pattachitra

Fig. 8 Patachitra from Kalighat.
Source: https://en.wikipedia.org/wiki/Kalighat_painting

Fig. 9 Mother and Child by Jamini Roy.
Source: https://trinityarts.co/product/jamini-roy-mother-and-child/

Fig. 10 Woman by Fernard Leger.
Source: https://www.facebook.com/photo/?fbid=1314621656893896&set=a.427791088910295

artist was Jamini Roy from West Bengal. Jamini Roy's style promoted the use of folk art in cities, focusing on the idea of a single, elite creator. Jamini Roy adopted the bold outlines, flat colours and two-dimensional forms of patachitra (Fig. 9). He did this by making a modern but clearly Indian style of art based on folk traditions. Later on, the art of Jamini Roy, influenced and inspired by Kalighat Patachitra, was popularized as Jamini Art among the people of Bengal. On the other hand, Kalighat patuas were mostly nameless and developed as a group, moving away from direct folk influence. These nameless artists have not been tagged as professional artists or as individuals. This contrast highlights the tension between the authority of an individual artist and the collaborative innovation of a group.

Another artist named Fernand Léger from France got inspiration from Kalighat pat. In 1931 he encountered the collection of Kalighat pat while he visited the Museum of Modern Art in New York City in the United States. His style of painting evolved gradually as he included the organic and flowing lines of Kalighat pat (Fig. 10).

The Kalighat pat's visual linguistics had a big impact not only on Jamini Roy and Léger. As it did with modern Bengal individualist artists like Sunayani Devi in the 1930s and 1940s, Nandalal Bose in the Haripura Congress posters, Abanindranath in his Chandimangal and Krishnamangal series, Nirode Mazumder, and Paritosh Sen etc. The artists took parts of the Kalighat Pat heritage and changed them to make their own art, which was not based on Euro-genetic Modernist painting. This led to a resurgence of Indian art [11]. Kalighat paintings gradually depicted the transition from folk culture to popular culture in 19th-century Bengal.

Apart from visual art, patachitra has become an inspiration in the field of advertising also. Advertising is a means to tell people about goods or services in order to get them to buy or utilize them. The main objectives of advertising are to inform, to persuade, and to remind. In this paper, I have analysed the journey of Patachitra in bridging folk culture and popular culture in Bengal. Now I would like to evaluate the journey of Patachitra as a part of popular culture in the advertising world. In advertising, patachitra is used as an aspirational association to gain the attention of the people they want to reach. Meanwhile, Jamini Roy's artwork, which is primarily based on patachitra, is also chosen for promotion in the field of advertising. Occasionally, the crafted image, the main visual element for advertisement, becomes an amalgamation of Kalighat Pat, Pingla Pat, and the art of Jamini Roy. As a whole, it becomes a tribute to our age-old traditional art practice of Bengal (Fig. 11).

Branding is an important part of promoting goods and services. The choice of any brand is based on an algorithm that helps us make decisions. Marketers use this algorithm to enhance the credibility of their brand story for potential buyers. To set a brand apart and gain a competitive edge, effective brand positioning plays a major role. The basic approach of positioning is not to create something new and different. Instead, positioning involves enhancing what already exists in the consumer's mind. The goal is to strengthen the existing connections. Positioning is not something you do to a product. Positioning is what you do to the mind of the targeted consumer you want to sell to. Interestingly, the product itself re-

Fig. 11 Mother's Day Advertising of 6 Ballygunge Place (Restaurant of traditional Bengali Cuisine). Source: https://www.adsoftheworld.com/campaigns/mother-s-day-0994096c-457d-4add-acf1-b581d8a0719d

mains unchanged; only the name, price, packaging, and other aspects are modified [12]. Hyperlocal marketing strategy has been used to get deeply connected in the consumer's mind. In this strategy, the target audience has been chosen in a very specific and geographically limited area. It is all about sending messages that are relevant to local audiences and are customized and time-sensitive.

For that reason, patachitra style becomes a popular option for variable products or services to retie connections between their prospective buyers in Bengal. The way the planes were drawn in patachitra made the graphic space two-dimensional. The tubular shapes, random shading along the edges, very simple shapes, and rearrangement of the planes, with figures taking up the whole picture area without any further decorations or props the strong lines, wide planes, bright colours, linear tensions, and rhythmic curves all work together to make a form of visual melody [13]. This simplification of forms, shapes, and colours helps to establish a pattern that would help people understand the subject without having to think about it. That's why patachitra becomes a popular choice of branding for any products, goods, and services.

Now I am going to discuss some advertisements where the patachitra style has been incorporated.

Star Ananda: Star Ananda now ABP Ananda is a Bengali news station organizing Sera Bangali event

Event Advertisement, Year of Making: 2012,
Agency: Bates Asia, Kolkata, India

The award ceremony was organized by Bengali news channel ABP Ananda to honour and celebrate remarkable people from all around Bengal and beyond in various fields. It was a series of event advertisements. Here we find that the babu is holding a cricket bat in an advertisement, and another one, Bibi, is playing a harmonium (musical instrument). The caption of this series is 'The award for the excellence of distinguished Bengalis.' (Fig. 12, 13).

Fig. 12 Star Ananda Event Advertisement. Source: Published in Srijon Samman 2012 by Pratidin Prakashani Pvt.Ltd. P – 48.

Fig. 13 Star Ananda Event Advertisement. Source: Published in Srijon Samman 2012 by Pratidin Prakashani Pvt.Ltd. P – 48.

Bodyline: Leisure Sports & Fitness Retail Brand

Leisure Advertisement, Year of Making: 2013,
Agency: Inner Circle, India

The caption of this advertisement is 'The fitness choice of Bengalis.' The entire advertisement is illustrated in a patachitra style, featuring Babu and Bibi exercising at the gym (Fig. 14).

Fig. 14 Bodyline.
Source: Published in Srijon Samman 2013 by Pratidin Prakashani Pvt.Ltd. P – 41.

Great Eastern: Leading Electronics and Home Appliances

Press Advertisement, Year of Making: 2015,
Published in Ananda Bazar Patrika, Kolkata,
12th April, Sunday, India. Agency: Unknown

The advertisement shows a deal for shopping at their store to celebrate the Bengali New Year. Here one babu is carrying a laptop, and another Babu is giving a mixer grinder to Bibi (Fig. 15).

Fig. 15 Great Eastern. Source: Published in Anandabazar Patrika 2015.

Sufi Sutra 2016: World Peace Music festival organized by Banglanatok.com

Year of Making: 2016, Kolkata, 6th February, Kolkata, India. Agency: Unknown

It was the 6th edition of Sufi Sutra, which was held from 6th to 7th February for celebrating in Rabindra Sadan and Nandan Campus in Kolkata. The goal of the festival is to connect Indian folk performers with people from all over the world through cultural exchange and to promote cultural diversity. In this advertisement all the Babus and Bibis having their hair styled are playing various musical instruments with joyful moods (Fig. 16).

Nukkad Printer: Printing Company

Printing Service Advertisement,
Year of Making: 2017, Agency: Monkey Wrench, India

Nukkad Printer is a printing center in Kolkata that provides a wide range of printing services based on client requirements. Kalighat Patachitra is used to illustrate the 'customization' service offered by Nukkad Printer. In April 2017, the campaign titled 'Local Marilyn, Local Monalisa, Local Hitlar' was published in India (Fig. 17).

Fig. 16 Sufi Sutra 2016. Source: Banglanatok.com 2016.

Fig. 17 Nukkad Printer. Source: https://www.adsoftheworld.com/campaigns/local-marilyn, 2017

Fortune's Hilsa Special Pack Kachi Ghani Oil (Mustard Oil)

Mustard Oil Advertisements, Year of Making: 2024,
Agency: Unknown, India

The recipe for Ilish/Hilsa is one of the popular cuisines among Bengalis. To promote their oil, Fortune Mustard Oil starts the Ilish Festival 2024 and creates a special packaging titled, Hilsa Special Pack.' In one advertisement, Babu is carrying a Hilsa fish, while in another, Bibi is cooking Hilsa while Babu helps her add some spices (Fig. 18).

Fig. 18 Fortune Kachi Ghani. Source: Banglanatok.com 2024.

As we see, the Babu becomes a cricket player, and the Bibi becomes a singer. Sometimes both are part of a musical band; sometimes they are body fitness freaks. Babu is carrying a laptop, and another babu is giving a mixer grinder to Bibi. Additionally, Babu assists Bibi with cooking, while Bibi is represented as a postmodernist version of either Marilyn Monroe or the Mona Lisa, and Babu is depicted as Hitler.

If we look back, we observe that Kalighat painting lost its glory in the early 20th century due to the advent of chromolithography and its cheap production. These cheap chromolithographs killed the hand-painted production. The themes and styles of Kalighat paintings, the series of Babus and Bibis, have been inspiring artists from various fields until today. The babu was a social category in colonial Bengal, but the patua's portrayal of him was full of irony, exaggeration, and keen social commentary. The 'Babu Bibi' series of Kalighat patachitra remains popular, inspiring designers to create branding that effectively communicates with prospective buyers. We still carry the colonial past with us. The Westernized Bengali Babu and Bibi reflect how colonial influence still shapes our cultural identity, showing both the continuity of the past and the evolution of the present. So, the concept of Babu and Bibi becomes a hybrid figure of two cultures, which has a relevance until today.

In advertising, we have seen the blended version of the Patachitra of Pingla and Kalighat. By incorporating the Patachitra style in advertising, brands can create unique, culturally relevant, and engaging campaigns that resonate with Indian audiences. Brands can develop distinctive, culturally appropriate, and captivating advertising campaigns that appeal to Indian consumers by adopting the Patachitra style. Companies are leveraging India's regional art to promote their products. In Bengal, many businesses try to sell their goods by giving them a Patachitra-style makeover. The optimal use of patachitra for promoting brands may be called the strategy of hyperlocal marketing. It helps your brand receive more attention and interaction from individuals in a certain area. This familiarity with the practice of patachitra among the people of Bengal enhances its effectiveness.

The patachitra style has been popular for a long time. This is due to its ability to convey information in a straightforward and visually appealing manner. Patachitra's journey continues, evolving from narrative tools to souvenirs and from home decor to marketing tools for advertising. Images can sometimes say more than words. It will be considered a unique style that showcases the cultural richness of Bengal to the world. The Kalighat Pat declined over time, but it continued to influence others. The Kalighat patachitra style seems like a phoenix, a bird that rises from the ashes. The Kalighat patachitra style is preserved in the museum, yet it serves as inspiration for various branding and promotional efforts. It becomes a recurring motif for positioning the identity of Bengal. It highlights how things have changed over time and how they are still the same. ■

Arpita Pradhan, PhD

References

1. https://www.daricha.org/sub_genre.aspx?ID=39&Name=Patachitra [access: 10.02.2026]
2. https://www.daricha.org/sub_genre.aspx?ID=39&Name=Patachitra [access: 10.02.2026]
3. Bhattachariya, Ashok., Banglar Chitrakala,Pashimbangya Bangal Akademi, Kolkata, India, September 2002.
4. Gupta Dutta, Sourabh., "Village of Painters": a Visit to Naya, 2011, https://www.chitrolekha.com/V1/n3/03_Patachitra_Bengal_Naya_Pingla.pdf [access: 11.09.2025]
5. Chaudhuri, Sharmistha, The Rise and Fall of Kalighat Paintings, https://www.sahapedia.org/rise-and-fall-kalighat-paintings [access: 05.09.2025]
6. https://dagworld.com/kalighat-pats.html [access: 05.09.2025]
7. https://www.vam.ac.uk/articles/kalighat-painting?srsltid=AfmBOorxFaTeQL6tS-koYGqhn4y2JiazFMPlhlKuhj_C4mz3aYQjA46O#slideshow=4207388&slide=0 [access: 05.09.2025]
8. Bhattachariya, Ashok., Banglar Chitrakala,Pashimbangya Bangal Akademi, Kolkata, India, September 2002, pp. 100-101.
9. https://www.vam.ac.uk/articles/kalighat-painting?srsltid=AfmBOorxFaTeQL6tS-koYGqhn4y2JiazFMPlhlKuhj_C4mz3aYQjA46O#slideshow=4207388&slide=0 [access: 05.09.2025]
10. Guha-Thakurata, Tapati,. The Making of A New 'Indian'Art : Artists, Aesthetics and nationalism in Bengal, c. 1850-1920, South Indian Edition, Cambridge University Press, Delhi, India, 2017, p. 24.
11. Kumar, Aloke., Fernand Léger was influenced by Kalighat Pats, Academia, July 2010. https://www.profalokekumar.in/writings/blogs/fernand-leger-was-influenced-by-kalighat-pats.html [access: 06.09.2025]
12. Ries, Al and Trout., Jack, Positioning:The Battle for Your Mind, Twentieth Anniversary Edition, Tata McGraw Hill Publishing Company Limited, New Delhi, India, 2003. p. 3.
13. https://en.banglapedia.org/index.php/Kalighat_Painting [access: 05.09.2025]

From Sacred Symbols to Binary Code

The Hidden Blueprint Behind All Creation

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peer-reviewed conference materials

This article is based on the presentation delivered at the C-IDEA Design Conference, held on 23-26 October 2025 at Shih Chien University, Kaohsiung Campus, Taiwan, China.

#Sacred Geometry #Yin and Yang #Polarity #Masculine and Feminine #Duality #Creation #Design #Digital Media #Art #Consciousness #Neuroscience #Geometry of Life #Design Thinking #Flow and Structure #Universal Patterns #Art-Science Integration #Holistic Design

Abstract

At the foundation of every act of creation – whether in art, design, science, or nature – lies a dynamic polarity: the interplay of yin and yang, feminine and masculine, magnetic and electric. This duality is not metaphorical; it is the very basis of sacred geometry, the universal language through which the cosmos organizes itself. From the intersection of a line and circle to the spirals of galaxies and neural networks, every form encodes this eternal dance of opposites. Sacred geometry is therefore not merely symbolic or decorative – it is the structural manifestation of polarity in visible, tangible form.

Across cultures, this principle has been recognized for millennia. Taoist philosophy describes yin and yang as the cyclical balance of receptivity and action, light and shadow. In Vedic cosmology, Shakti and Shiva embody the creative tension between energy and consciousness. Modern physics and neuroscience echo these insights: magnetic and electric forces, matter and energy, order and chaos, are interdependent, and creation emerges when these polarities find coherence. Even the binary code of 1 and 0 – the foundation of digital media – reflects this primordial duality, producing infinite possibilities when brought into interaction.

Sacred geometry offers a symbolic and structural map of these forces. The circle represents the feminine: infinite, flowing, and receptive; the line represents the masculine: finite, directed, and structured. Their union generates the vesica piscis, the creative womb of form, from which all further geometrical patterns unfold, including the Flower of Life and Platonic solids. Each pattern illustrates that creation arises not from singularity but from the integration of opposites – demonstrating that structure and flow, logic and intuition, action and receptivity are inseparable.

For contemporary artists and designers, this understanding opens transformative paradigms: design becomes the conscious orchestration of balance, where structure enlivens flow and intuition informs form. For scientists, polarity offers a bridge connecting neuroscience, quantum physics, and archetypal patterns, fostering knowledge that is not only observed but embodied, not only rational but also felt. For society, it provides a vision of balance: not rejecting what has been built, but reshaping it with compassion and creativity.

Neuroscience supports this integration: studies of heart-brain coherence show that physiological alignment enhances perception, resilience, and creativity. When internal masculine and feminine energies harmonize, individuals expand their capacity to generate meaningful, inspired work. Collectively, when culture, technology, and nature find resonance, new possibilities emerge for co-creation.

Sacred geometry is not an abstract study of form; it is a living, actionable blueprint. Recognizing polarity as the generator of creation allows us to understand the architecture of the universe and our dual role as creators and creations. By embracing this principle, we see that geometry is not only a record of ancient wisdom but also a guide for designing, innovating, and evolving in harmony with the cosmos – a true bridge from sacred symbols to binary code.

Introduction

Humanity has always sought to understand the underlying patterns of existence. From the temples of ancient civilizations to the binary codes of modern computing, the search for order and meaning has revealed a profound truth: creation emerges from polarity. Two primal forces – often described as masculine and feminine, structure and flow, Yang and Yin – interact to generate form, energy, and life. These forces are not opposites in conflict, but complementary aspects of one whole, whose union gives rise to a third creative current: manifestation.

Sacred geometry provides a way to map and visualize this interplay. It is the study of the mathematical patterns and proportions underlying the natural world – from atomic structures to galaxies – and the symbolic forms that represent the principles of creation. Sacred geometry is not merely aesthetic; it is a framework that connects mathematics, cosmology, design, and consciousness. In yogic terms, this balance is mirrored by symbolic systems, like the Yin & Yang, the third eye that perceives all, and the Sri Yantra – a geometric mandala that represents the cosmos and

the self and emits the frequency of the union of masculine and feminine, the inner and outer universe. By revisiting this ancient wisdom through the lens of digital media, experimental art, and human experience, we open new pathways of thought and creation.

Polarity as the Basis of Creation

Polarity is the pulse of the universe. Every system of existence operates in cycles of expansion and contraction, growth and release, order and chaos. The human heartbeat, the oscillation of electromagnetic waves, and the binary logic of digital code all echo this same principle.

In Eastern traditions, duality is embodied as Yang (structure, action, linearity) and Yin (flow, receptivity, circularity). In Vedic cosmology, it is Shiva and Shakti – the masculine and feminine archetypes of cosmic creation [1]. Each contains a seed of the other, as reflected in the of Yin and Yang symbol – unity through reciprocity. Modern physics expresses the same truth through the dynamic interplay of particle and wave, energy and matter.

Modern science, though expressed in a different language, affirms this ancient insight. Binary code – the 1s and 0s of digital systems – is meaningless alone; in interaction, and multiplication it creates entire virtual worlds. Physics shows that attraction and repulsion, wave and particle, arise through dynamic exchange. In electricity, frequency determines how often current changes direction – just as in life, our internal frequencies, moods, and intentions shape the realities we experience.

This pulsation is the very foundation of geometry. Historically, geometry was studied as a key to understanding both the cosmos and the self [2]. Polarity is not division – it is the dynamic tension that generates vibration, resonance, and ultimately, life.

Sacred Geometry as the Language of Union

From binary code to sacred geometry, creation always arises from the meeting of opposites. Every digital world, every piece of media art, emerges from the interplay of 1 and 0. On their

own, these values carry little meaning; together, they generate infinite possibilities. Sacred geometry translates this principle into form.

The line and the circle, Yang intersecting Yin, create the Vesica Piscis – the first generative intersection – from which the Flower of Life unfolds, the matrix of all geometrical patterns [3]. Each form carries both mathematical precision and symbolic, and energetic resonance. Polarity becomes visible as structure, flow, and rhythm, both scientific and poetic. In music, we experience this same geometry in motion: frequency and form uniting to create harmony. Sound only arises when vibration meets instrument and observer – just as creation emerges when structure meets consciousness.

For creators, this is practical as well as metaphorical. Digital media is built on binary code yet offers endless space for fluid, intuitive, and imaginative expression. By recognizing this dual basis, designers, artists, and scientists can navigate between system and spontaneity, algorithm and intuition. Sacred geometry is often dismissed as ornamental, yet it encodes the architecture of existence – the sacred union of seemingly opposite forces. In the Quadrivium, geometry was studied alongside number, music, and cosmology as a path to understanding creation itself [4].

Creator and Creation

The essence of polarity lies in recognizing that we are both creators and creations. We build systems, technologies, and environments that structure our world, yet we are shaped by them, just as water takes the contours of the vessel that holds it. A house exemplifies this: walls, foundations, and plans represent Yang – structure, boundary, stability. Yin – decoration, feeling, atmosphere, and emotional resonance – transforms it into a home.

Balance between these forces creates thriving spaces; imbalance leads to stagnation or collapse, which itself is a form of creation, inviting renewal.

This principle extends beyond architecture. Social and political systems, personal life arrangements, and artistic frameworks follow the same geometry. Structures are necessary, yet when they no longer resonate with emotional and intuitive flow, we are called not to reject structure but to reshape it. Awareness is the first step: by recognizing the patterns we inhabit, we gain the power to change them [5].

The mind decodes matter, yet the heart writes the unfolding script through the frequency it radiates. This exchange is continuous: our electromagnetic field / our aura interacts with, shapes, and is shaped by the environments we inhabit.

By changing our own vibration, we reshape not only perception but also form – both within and around us.

When the poles of creation are harmonized, art transcends its medium and becomes transformative. The most impactful works emerge when emotion is structured, and structure is enlivened by emotion. By uniting subjective and objective, inner and outer, we approach a more holistic form of knowledge [6]. Creation, after all, is not the end but the continuous birth of new experiences – an ever-evolving invitation to play, explore, and expand and delight in the process

Toward Balance

Modern (Western) societies lean heavily toward Yang: structure, productivity, logic. While valuable, these qualities often overshadow Yin: receptivity, intuition, and emotional intelligence. The result is disconnection – from ourselves, from nature, from meaning.

The way forward is not to reject structure but to rebalance. By integrating Yin and Yang, logic and intuition, art and science, we align with the fundamental blueprint of creation. Sacred

geometry offers a map. Neuroscience demonstrates that heart-brain coherence enhances creativity, resilience, and well-being [7]. Physics shows that complexity emerges not from rigid order or pure chaos, but from the interplay of both forces, movement, and stillness, masculine and feminine energies.

When we embrace dynamic balance, creation becomes not only possible but joyful. We remember that we are not fixed within structures but capable of reshaping them. We are not separate from creation, but active participants in its unfolding.

Conclusion

The geometry of creation teaches that polarity is not division but unity. Structure and flow, masculine and feminine, 1 and 0: these archetypal forces generate all forms, from spirals of galaxies to rhythms of human breath. To study sacred geometry is to study ourselves – as both creators and creations.

For art, design, media, and society, this insight opens pathways for integrating intuition and logic, science and spirituality, order and play. For society, it offers a vision of balance: not rejecting what has been built, but reshaping it with compassion and creativity. The greatest insight of sacred geometry is that creation is alive. It is not static but pulsating, not either/or but both/and.

Here, design, art, science, and spirit converge. Here, wholeness is not found in erasing difference but in integrating it. And here, we remember: we are not separate from creation but active participants in its unfolding, capable of reshaping both society and ourselves in resonance with the geometry of life. ■

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References

1. Feuerstein, G. (2003). The Yoga Tradition. Prescott: Hohm Press.
2. Lawlor, R. (1982). Sacred Geometry: Philosophy and Practice. New York: Thames & Hudson.
3. Ghyka, M. C. (1977). The Geometry of Art and Life. New York: Dover Publications.
4. Martineau, J., Lawson, D., & Robertson, M. (2010). Quadrivium: The Four Classical Liberal Arts of Number, Geometry, Music, and Cosmology. New York: Wooden Books.
5. Dispenza, J. (2014). You Are the Placebo: Making Your Mind Matter. Carlsbad: Hay House.
6. Jung, C. G. (1968). The Archetypes and the Collective Unconscious. Princeton: Princeton University Press.
7. McCraty, R., Atkinson, M., Tomasino, D., & Bradley, R. T. (2009). The Coherent Heart: Heart- Brain Interactions, Psychophysiological Coherence, and the Emergence of System-Wide Order. Integral Review, 5(2), pp. 10-115.

The Role of ARTIFICIAL INTELLIGENCE IN LANDSCAPE ARCHITECTURAL BIOMIMICRY

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peer-reviewed conference materials

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#Artificial intelligence
#Biomimicry
#Climate adaptation
#Urban heat island
#Landscape architecture
#Helianthus annuus L.

Abstract

The accelerating impacts of climate change have made urban heat mitigation a critical design priority. Record-breaking heat waves across Europe, Asia, North Africa, and North America in 2025 reaffirmed the urgency of rethinking shading systems within dense urban environments. This research explores how artificial intelligence can augment biodesign thinking to develop responsive, ecologically integrated shading structures for climate-adaptive cities.

The Sunflower Parasol represents a speculative AI-assisted design concept that transforms the conventional polyester parasol — typically non-biodegradable and environmentally detrimental — into a living canopy covered with vegetation. Drawing inspiration from the morphology and heliotropic behavior of Helianthus annuus L. (the common sunflower), the project employs AI-driven generative modeling and visualization to simulate biomimetic forms and environmental performance. Through iterative digital experimentation in ArchiCAD and rendering with the Nano Banana AI tool, the design explores how computational intelligence can replicate natural logics such as evapotranspiration, solar orientation, and dew collection to regulate microclimates.

By integrating AI methods with principles of landscape architecture and biomimicry, the Sunflower Parasol demonstrates the potential of machine intelligence to mediate between natural and synthetic systems. The concept challenges traditional boundaries between digital design and living materials, positioning AI not merely as a visualization tool but as a collaborative design partner in ecological innovation. Ultimately, this study highlights how AI-assisted biodesign can inform new forms of climate-responsive infrastructure, promoting regenerative, adaptive, and symbiotic urban environments.

Introduction

Background and motivation

Rapid urbanization and intensifying climate change have amplified the urban heat island effect, posing serious risks to public health, ecological balance, and urban livability [1, 2]. Record-breaking heat waves across multiple continents in 2025 have underscored the urgency of developing adaptive and sustainable shading systems within dense urban environments [3]. Traditional shading structures — often composed of synthetic and non-biodegradable materials — offer limited ecological benefits and fail to contribute to microclimate regulation.

Biomimicry, the practice of emulating nature's strategies in design, offers promising pathways toward sustainable and adaptive solutions in landscape architecture. Research demonstrates that biomimetic approaches can enhance environmental resilience and performance. For instance, light-responsive kinetic systems inspired by the Gazania flower illustrate how natural forms can inform functional design innovations [4]. Such principles highlight the potential for living and dynamic structures that respond intelligently to climatic stimuli.

In parallel, recent advancements in artificial intelligence (AI) have expanded the possibilities of computational design. AI tools facilitate rapid prototyping, simulate environmental conditions, and optimize spatial configurations, enabling designers to generate photorealistic renderings

and evaluate performance in real time [5]. This technological shift allows for efficient exploration of design alternatives while enhancing communication with stakeholders. AI-driven modeling and visualization also enable the generation of biomimetic forms aligned with natural processes [6, 7], though their application in climate-responsive urban infrastructure remains underexplored [8].

Emerging platforms such as Nano Banana — an AI-powered image generation and editing tool developed by Google — are redefining digital design workflows [9]. By transforming text or images into high-fidelity 3D models, Nano Banana supports diverse visualization modes, including blueprints and 3D-printed models. Comparative studies have shown its precision in interpreting prompts and producing visually compelling results, making it a valuable tool for landscape and architectural designers [10].

This research is motivated by the need to merge AI-driven design tools with ecological principles to create responsive, regenerative, and living urban systems. The Sunflower Parasol project exemplifies this synthesis, demonstrating how AI can act as a collaborative design partner in developing nature-inspired, climate-adaptive shading structures.

Problem statement

Despite growing awareness of climate adaptation strategies, contemporary urban shading systems remain largely static, material-intensive, and environmentally unsustainable [11, 12]. These systems typically rely on synthetic materials that contribute to waste accumulation and fail to engage with ecological processes such as evapotranspiration or solar tracking. While advancements in artificial intelligence (AI) have transformed design visualization and performance simulation, their application in developing biomimetic and living shading systems remains underexplored [7, 8].

In landscape architecture, the integration of AI and biomimicry presents an opportunity to move beyond conventional static structures toward adaptive, data-informed, and ecologically responsive design solutions. However, there is a research gap in understanding how AI can be systematically employed to simulate, test, and generate biodesign concepts that replicate natural behaviors — such as heliotropism or humidity regulation — within urban microclimates [6, 12]. Moreover, the lack of accessible, high-fidelity AI visualization tools limits experimentation in early design stages, constraining innovation in climate-adaptive architectural design [14, 15].

This study addresses these challenges by exploring how AI-assisted design tools, particularly the Nano Banana platform, can augment biodesign thinking in developing responsive, ecologically integrated shading systems. Through the Sunflower Parasol concept, the research aims to demonstrate the potential of AI as a collaborative design partner that bridges the gap between digital modeling and living ecological performance, contributing to the discourse on regenerative and climate-resilient urban design.

Research objectives

The primary objective of this research is to explore how artificial intelligence (AI) can enhance biodesign thinking to create responsive and ecologically integrated shading systems within urban environments. Building on the conceptual foundation of the Sunflower Parasol, the study aims to demonstrate the potential of AI as a design collaborator that bridges digital modeling and living systems for climate adaptation.

The specific objectives are to:

1. I nvestigate how AI-driven generative modeling and visualization tools can simulate biomimetic forms and environmental behaviors inspired by Helianthus annuus L. (sunflower morphology and heliotropism).
2. Examine the role of AI tools such as Nano Banana in facilitating rapid prototyping, environmental simulation, and high-fidelity visualization for climate-adaptive urban design.
3. Develop a speculative design framework that integrates principles of landscape architecture, biomimicry, and computational intelligence to guide the creation of living, regenerative shading systems.
4. Evaluate the implications of AI-assisted biodesign for promoting sustainable, adaptive, and symbiotic urban environments in the context of accelerating climate change.

Through these objectives, the study contributes to the growing discourse on AI-assisted ecological design, highlighting pathways toward regenerative and climate-resilient urban futures.

Research Methodology

This study adopts a qualitative and design-based research methodology, combining theoretical exploration, digital experimentation, and visual analysis to investigate the integration of artificial intelligence (AI) in biodesign-oriented landscape architecture. The approach is structured into three interrelated phases: conceptual development, computational simulation, and visual synthesis.

In the conceptual development phase, relevant literature on biomimicry, AI-assisted design, and climate-responsive architecture was reviewed to establish the theoretical foundation of the Sunflower Parasol concept [6, 7, 8]. Key ecological strategies from Helianthus annuus L. — including heliotropism, evapotranspiration, and surface morphology — were analyzed to identify potential analogues for design translation.

The computational simulation phase involved the use of AI-driven generative modeling and parametric visualization tools. ArchiCAD served as the primary modeling platform for structural development, while the Nano Banana AI tool [9] was employed for generating photorealistic renderings, simulating environmental performance, and visualizing vegetated canopies under varying climatic conditions. Iterative digital experiments enabled the refinement of form, materiality, and environmental response.

Finally, in the visual synthesis phase, the outputs were evaluated qualitatively to assess their capacity for climate responsiveness, ecological integration, and aesthetic coherence. The process highlights AI not merely as a visualization aid but as a collaborative design partner capable of simulating natural processes and enhancing ecological innovation. Findings from these phases collectively inform a speculative framework for integrating AI-assisted biodesign into climate-adaptive urban infrastructure.

Expected results and contribution

The research is expected to demonstrate that integrating artificial intelligence (AI) into biodesign processes can significantly enhance the capacity of landscape architecture to address climate adaptation challenges. Through the Sunflower Parasol project, the study anticipates producing a speculative prototype that illustrates how AI-assisted generative modeling and visualization can replicate natural logics — such as heliotropism, evapotranspiration, and solar regulation — to create responsive and ecologically active shading systems.

The expected outcomes include:

1. A conceptual and visual model of a living, AI-assisted shading structure that dynamically interacts with its environment.
2. A methodological framework for integrating AI-driven biomimetic design into climate-adaptive landscape architecture.
3. Insights into the role of AI as a co-creative design partner, capable of mediating between synthetic materials and living systems.
4. New perspectives on how computational design tools, such as Nano Banana, can support regenerative and sustainable urban design practices.

The broader contribution of this research lies in advancing discourse on AI-assisted ecological design by bridging the gap between digital intelligence and environmental responsiveness. It proposes a shift from static, material-based solutions to adaptive, symbiotic infrastructures that promote resilience and regeneration in the urban fabric. Ultimately, the study positions AI not as a replacement for human creativity, but as a catalyst for co-evolutionary design thinking that aligns with natural systems.

Overview of previous research

Urban heat and the limits of conventional shading

The urban heat island (UHI) phenomenon is well documented as a critical urban-climate challenge: cities routinely record higher temperatures than surrounding rural areas, with impacts on health, energy use, and air quality [1]. Evidence and reviews highlight that rising urban temperatures increase cooling demand and exacerbate heat-related morbidity, emphasizing the need for multi-scalar mitigation strategies. Conventional shading — awnings, fixed canopies, and polyester parasols — provides immediate local comfort but is often made from non-biodegradable, resource-intensive materials and lacks dynamic responses to changing microclimatic conditions [1, 2].

Green infrastructure, evapotranspiration, and adaptive microclimates

Green infrastructure (vegetation, green roofs, and living facades) reduces ambient temperatures through shading and evapotranspiration;

reviews note significant cooling potentials but also stress the importance of species selection, irrigation needs, and maintenance regimes for sustained performance [2]. Studies show that integrating vegetation into built elements can moderate surface temperatures and improve human thermal comfort, but uptake is limited by maintenance costs, structural constraints, and insufficient integration with responsive control systems. These limitations suggest the value of hybrid approaches that combine living systems with intelligent control and adaptive form.

Biomimicry and natural logics for responsive design

Biomimicry has been influential in framing design strategies that emulate functional principles found in nature — using nature as model, measure, and mentor [16]. Architectural and landscape research has translated biological phenomena (e.g., light-responsive movement, structural efficiency, moisture capture) into kinetic facades, shading devices, and material innovations [6, 4]. Work on plant heliotropism (sun-tracking) and growth-mediated responses, notably in Helianthus annuus L., provides an empirical basis for designing structures that track solar position or modulate orientation to optimize shading and daylighting [17, 18]. Biomimetic strategies thus offer conceptually appropriate templates for shading systems that actively manage incident radiation and microclimate.

Engineered living materials and living architecture

The field of Engineered Living Materials (ELMs) and research into living architecture explore how biological cells and organisms can be integrated into materials and building systems to provide self-repair, responsiveness, and environmental services [19, 20]. Reviews document promising advances — microbial-based concretes, photosynthetic biocomposites, and plant-integrated systems — but also identify hurdles in durability, safety, regulatory frameworks, and integration with digital design workflows. ELMs point toward a future where shading devices are not merely vegetated add-ons but hybrid systems with emergent, regulated behaviors.

Computational design, AI, and generative visualization

Computational design methods (parametric and generative design) have enabled architects and landscape designers to explore vast design spaces, optimize for performance metrics, and prototype complex biomimetic geometries [8, 7]. More recently, AI-driven tools — ranging from physics-informed simulation to generative image models — have accelerated visual iteration and enabled new forms of designer-machine collaboration. Contemporary image and model-generation systems (e.g., Google's Nano Banana as integrated within the Gemini ecosystem) demonstrate rapid, high-fidelity visualization workflows that support concept development and stakeholder communication [10]. While promising for visualization and early-stage ideation, many AI tools remain underleveraged for integrative performance simulation and for translating visuals into constructible, living prototypes.

Gaps and syntheses relevant to the Sunflower Parasol

Cross-disciplinary reviews indicate several converging gaps: (1) a scarcity of research that operationalizes biological behaviors (e.g., heliotropism, evapotranspiration) into digitally simulated, constructible shading systems; (2) limited integration between AI visualization tools and engineering/biological performance models; and (3) sparse empirical studies on hybrid living/synthetic canopies that are both ecologically functional and digitally designed. Collectively, these gaps motivate exploratory, design-led research that

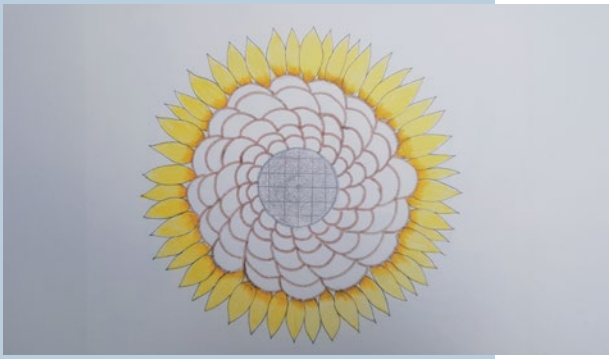


Fig. 1 Hand sketch of Sunflower parasol design.
Source: Own study.

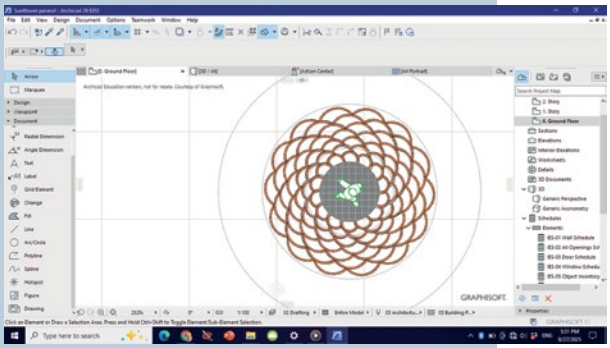


Fig. 2 Development of the parasol design in ArchiCAD.
Source: Own study.

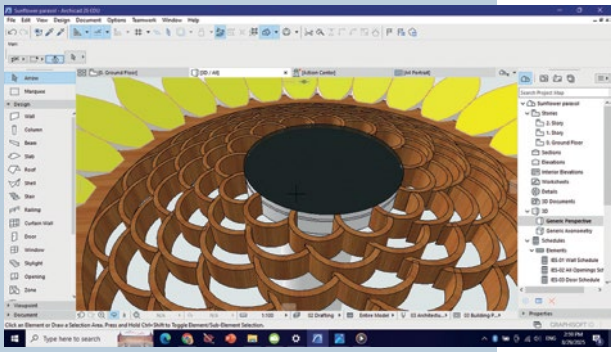


Fig. 3 3D view of the parasol design in ArchiCAD.
Source: Own study.

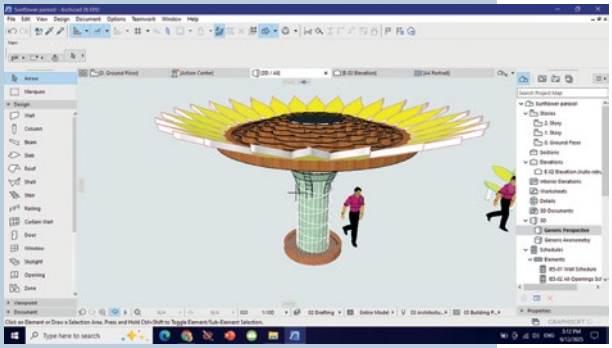


Fig. 4 3D view of the parasol design in ArchiCAD.
Source: Own study.

couples biomimetic theory, ELM concepts, and AI-assisted generative workflows — precisely the niche the Sunflower Parasol aims to occupy by using AI as a co-creative tool to prototype living, climate-responsive shading.

Methodology

The initial phase of the design process involved a detailed study of the geometric and morphological patterns of Helianthus annuus L. (the common sunflower). Hand sketches were produced to explore the flower's radial symmetry, petal arrangement, and central disc geometry — features that informed the conceptual framework of the Sunflower Parasol's canopy design. In the subsequent phase, the design was digitally developed and refined using Building Information Modeling (BIM) software, ArchiCAD. This platform facilitated accurate 3D modeling, structural visualization, and iterative adjustments to optimize both aesthetic composition and functional performance.

Figure 1 illustrates a hand sketch of Helianthus annuus L., highlighting the Fibonacci spiral pattern evident in the central seed head. This natural geometric arrangement served as the primary inspiration for the design of the Sunflower Parasol's porous wooden canopy, envisioned as a structural framework that supports the growth of climbing plants. The initial hand sketch was subsequently refined and digitally modeled in ArchiCAD. The software's 3D visualization capabilities facilitated a more detailed exploration of form, proportion, and material expression. Dimensional calculations were performed to ensure that the canopy achieved an appropriate scale, balancing aesthetic considerations with structural and functional requirements. The design also incorporated practical factors, such as estimating the number of users who could be shaded simultaneously, to enhance usability and comfort.

Next, the design was adjusted further to mimic the geometric structure

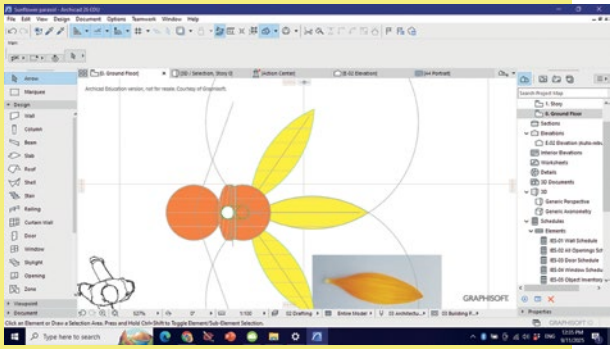


Fig. 5 Bench design based on the geometry of Helianthus annuus L. ray floret. Source: Own study.

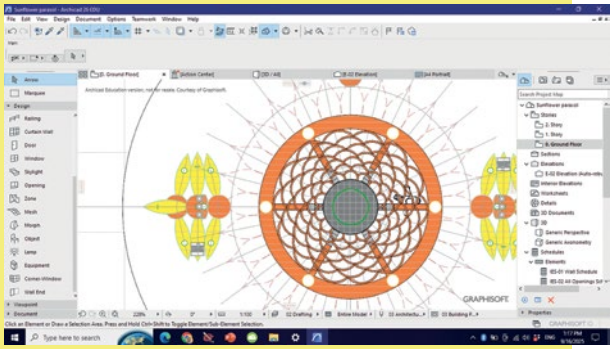


Fig. 6 Arrangement of the benches around the Sunflower parasol. Source: Own study.

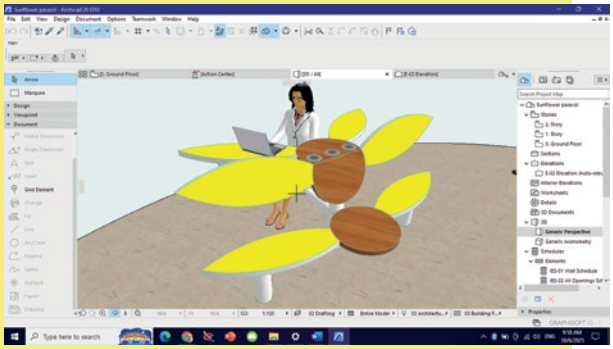


Fig. 7 Bench design with three seats, two backrests, and two work surfaces. Source: Own study.

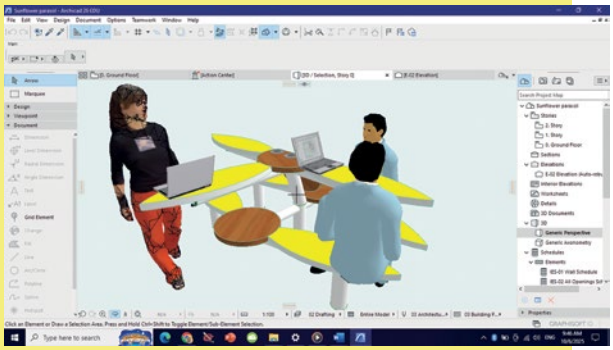


Fig. 8 Bench design with four seats and three work surfaces. Source: Own study.

of the flower of Helianthus annuus L. The height of the structure was calculated to be in harmony with established rules for safety and comfort of users of the public space. Figures 3 and 4 showcase the 3D views of the parasol in ArchiCAD'S 3D view window. The design integrates a centrally positioned solar panel that powers the parasol's lighting system, enhancing the structure's energy efficiency and overall sustainability. Inspired by the elegant curvature of the Helianthus annuus L. flower, the canopy's support beams translate botanical geometry into architectural form.

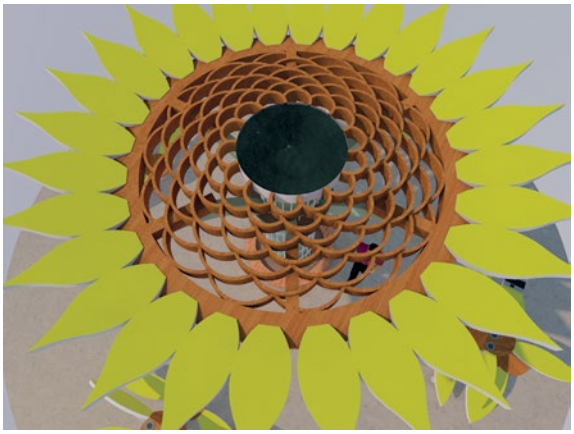


Fig. 9 Render of the parasol's canopy using CineRender. Source: Own study.

Fig. 10 Render of the parasol's side-view using CineRender. Source: Own study.

Fig. 11 Render of the parasol's view from the bottom using CineRender. Source: Own study.

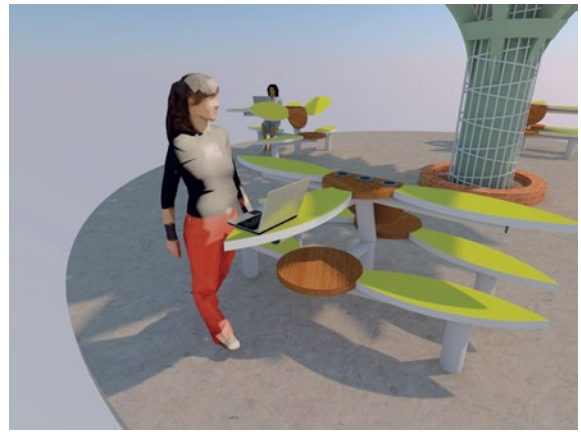


Fig. 12 Render of view of the parasol bench using CineRender. Source: Own study.

Subsequently, benches inspired by the spear--like geometric shape of the ray floret of Helianthus annuus L. were designed to be positioned beneath the parasol as shown in figures 5 to 8. Some of the benches were designed in response to contemporary health science trends, which discourage prolonged sitting. Each of these benches incorporates an attached platform that allows users to place a laptop or book, enabling them to work comfortably outdoors while standing.

The penultimate step in the design process involved generating several 3D views of the parasol using ArchiCAD's built-in rendering engine, CineRender. While the resulting renders were visually appealing, they did not fully convey the

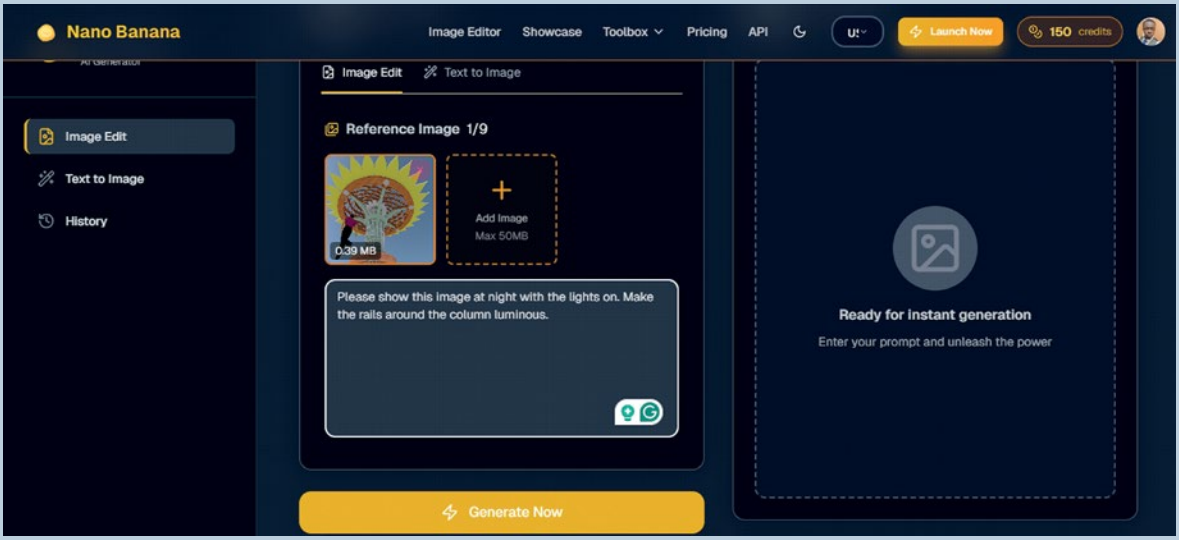


Fig. 13 Render of view of the parasol bench using CineRender.
Source: Own study.

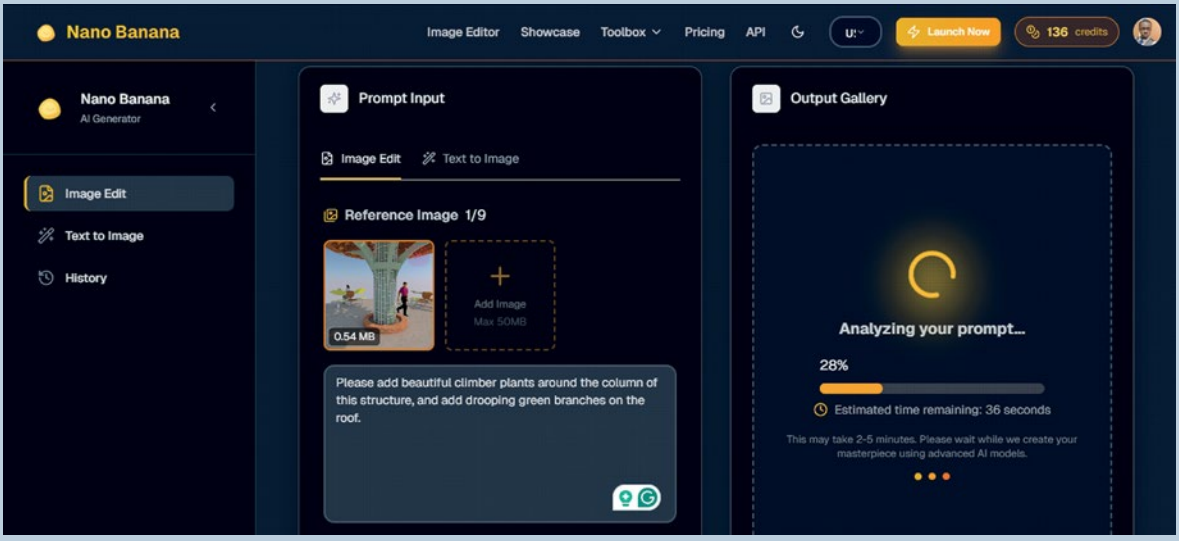


Fig. 14 Screenshot showing the Nano Banana AI tool processing the rendering instructions.
Source: Own study.

intended experience. The author sought to illustrate the parasol's lighting system at night and depict lush climbers growing around the central pillar and cascading from the canopy. Due to ArchiCAD's limited selection of plant materials, Artificial Intelligence was employed to enhance these visualizations. Below are the basic perspective views of the design derived from CineRender.

The final step involved uploading the CineRender images to the Nano Banana online AI platform. Specific prompts were provided for each image to guide the AI in applying desired effects, such as night-time lighting and the addition of plant materials. Screenshots of the prompts are presented below (Fig. 13 and 14), followed by the resulting images (Fig. 15-18).

Results and Discussion

The design experiment produced detailed renderings of the Sunflower Parasol, illustrating both its aesthetic and functional potential. Figure 15 presents a Nano Banana AI rendering of the

Fig. 15 Nano Banana AI render of the parasol lighting system. Source: Own study.

Fig. 16 Nano Banana AI render of the parasol's greenery. Source: Own study.

Fig. 17 Nano Banana AI render of the parasol's sunset mood. Source: Own study.

Fig. 18 Nano Banana AI render of the benches' lighting. Source: Own study.

parasol's lighting system, which highlights the yellow hues of the sunflower's ray florets. The lighting is powered by a solar panel positioned atop the canopy. Its placement and orientation were optimized using ArchiCAD and Nano Banana simulations, allowing the canopy to emulate the natural heliotropic behavior of Helianthus annuus L., maximizing illumination and solar energy capture. The solar system is estimated to provide up to 6 hours of nighttime lighting under full sun conditions.

Figure 16 depicts the parasol integrated with climbing plants, suggesting a living structure capable of supporting urban biodiversity. The design encourages interactions with pollinators such as bees and small birds. Figures 17 and 18 illustrate the canopy's suitability for nighttime activities, providing seating for up to 10-12 users simultaneously, accommodating study, work, or social interactions comfortably.

Functionally, the porous wooden canopy allows partial light penetration while supporting vegeta-

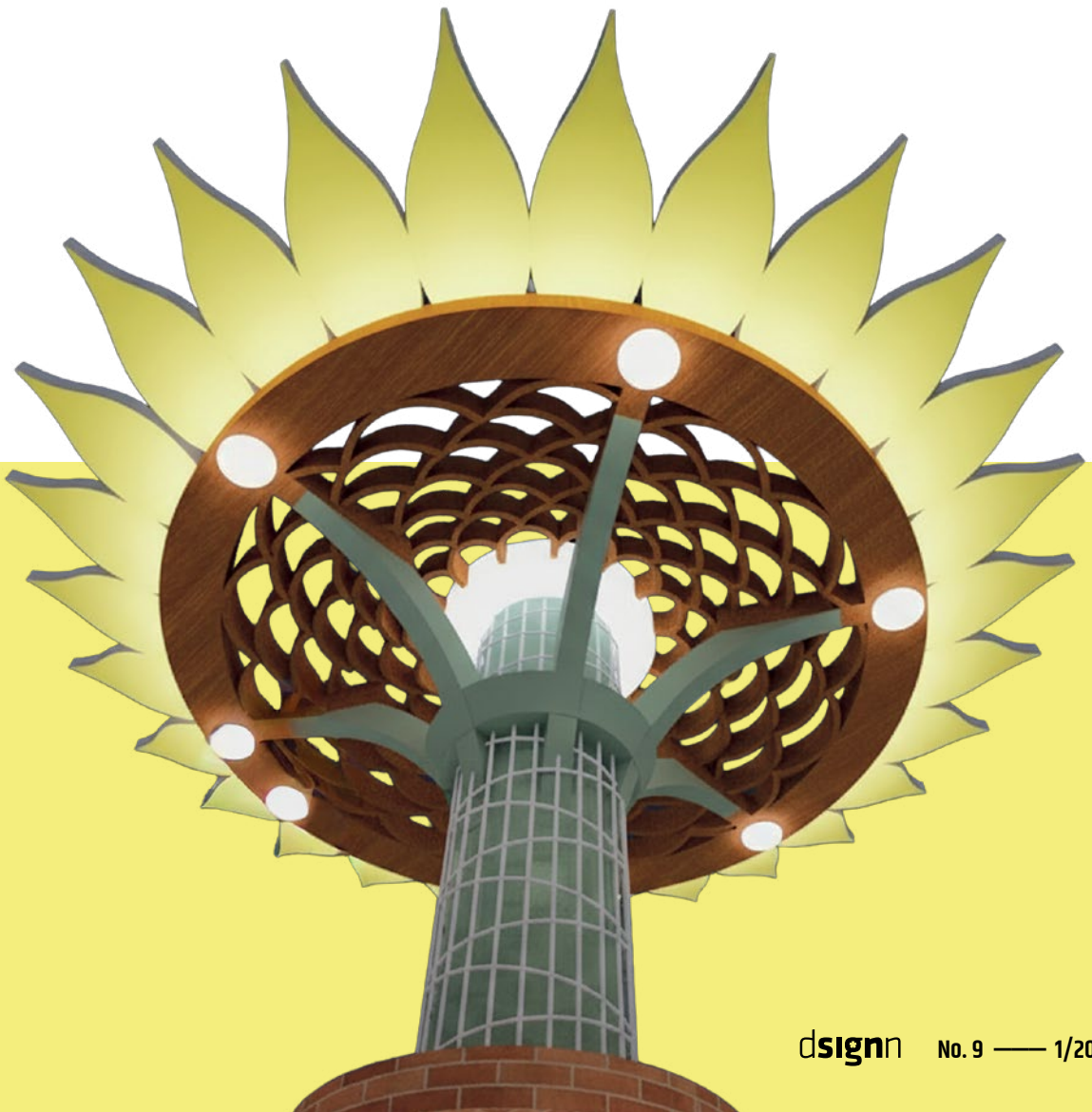
tion growth, facilitating microclimate regulation through shading, evapotranspiration, and thermal buffering. Preliminary estimates indicate the canopy could reduce local ground temperature by 2-4°C during peak sun hours, enhancing user comfort in dense urban settings.

From a computational perspective, the integration of AI-assisted visualization with ArchiCAD enabled rapid iterative design, testing multiple configurations in a short period. This allowed optimized placement of structural elements, vegetation supports, and lighting fixtures. The results suggest that AI can act as a collaborative design partner, bridging natural inspiration, functional requirements, and environmental performance within a single workflow.

Overall, the Sunflower Parasol demonstrates how AI-assisted biodesign can produce visually compelling, ecologically responsive, and user-centered shading systems, providing a model for climate-adaptive urban infrastructure. These findings underscore the potential of computational intelligence not merely as a visualization tool, but as a strategic partner in designing regenerative and symbiotic urban environments.

Conclusion

This study demonstrates the potential of integrating artificial intelligence (AI) with biomimetic principles to develop climate-responsive urban shading systems. The Sunflower Parasol project exemplifies how computational tools can act as collaborative design partners, translating the natural logics of Helianthus annuus L. — such as heliotropism, structural geometry, and evapotranspiration — into functional, ecologically integrated infrastructure.



The combination of ArchiCAD and AI-assisted visualization via Nano Banana enabled rapid iterative design, precise structural scaling, and simulation of environmental performance, resulting in a living canopy capable of supporting vegetation, regulating microclimates, and accommodating users comfortably. Moreover, the incorporation of solar-powered lighting demonstrates the feasibility of self-sustaining, multifunctional urban structures that merge aesthetics, utility, and ecological responsiveness.

Overall, the findings suggest that AI-assisted biodesign can move beyond traditional visualization, serving as a tool for regenerative, adaptive, and symbiotic urban design. By bridging natural inspiration, functional requirements, and computational intelligence, this approach offers a scalable framework for creating shading infrastructure that responds dynamically to climate challenges while enhancing biodiversity, user comfort, and urban resilience. Future research could further quantify performance metrics and explore material innovations to advance AI-assisted living architecture in diverse urban contexts. ■

Benjamin Chemarum

References

1. Oke, T. R., Mills, G., Christen, A., & Voogt, J. A. (2017). Urban climates. Cambridge University Press. https://doi.org/10.1017/9781139016476
2. Santamouris, M. (2020a). Minimizing energy consumption, energy poverty and global and local climate change in the built environment: Innovating to zero. Elsevier. https://doi.org/10.1016/C2018-0-02357-6
3. World Meteorological Organization (WMO). (2025). Global climate update: Record-breaking heat events. Geneva, Switzerland. https://public.wmo.int/en/media
4. Jović, M., & Mitić, D. (2020). Nature-inspired kinetic systems in architecture: Lessons from the Gazania flower. Architectural Science Review, 63(1), pp. 1-4. https://doi.org/10.1080/00038628.2020.1714435
5. Fernberg, J. (2023). Artificial intelligence in landscape architecture: Enhancing visualization and workflow efficiency. Journal of Digital Design Research, 5(2), pp. 1-10.
6. Roudavski, S. (2009). Towards morphogenesis in architecture. International Journal of Architectural Computing, 7(3), pp. 345-374. https://doi.org/10.1260/147807709789621280
7. Oxman, N. (2016). Age of entanglement: A framework for material ecology. Journal of Design and Science, 1(1), pp. 1-16.
8. Kolarevic, B., & Malkawi, A. (Eds.). (2005). Performative architecture: Beyond instrumentality. Spon Press.
9. Landscape Architecture Store. (2025a). Free AI for architecture and design: Exploring Nano Banana. https://landscapearchitecture.store/blogs/news/free-ai-for-architecture-and-design-exploring-nano-banana
10. Tom's Guide. (2025). I tested Nano Banana vs. Midjourney with 9 AI image prompts — here's the surprising winner. https://www.tomsguide.com/ai/i-tested-nano-banana-vs-midjourney-with-9-ai-image-prompts-heres-the-surprising-winner
11. Santamouris, M. (2020b). Recent developments on cool and reflective strategies for urban heat mitigation. Renewable and Sustainable Energy Reviews. https://doi.org/10.1016/j.rser.2020.110275
12. Emmanuel, R., & Krüger, E. (2012). Urban heat island and its impact on climate change resilience in a shrinking city: The case of Glasgow, UK. Building and Environment, 53, pp. 137-149. https://doi.org/10.1016/j.buildenv.2012.01.020
13. Jović, M., & Mitić, D. (2020). Exploration of nature-based biomimetic approach in designing urban elements. Visual Computing for Industry, Biomedicine and Art, 3(1), pp. 1-2. https://vciba.springeropen.com/articles/10.1186/s42492-020-00060-y
14. Fernberg, P. (2023). Artificial intelligence in landscape architecture: A literature review. Utah State University, Logan, pp. 1-2. https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1169&context=laep_facpub
15. Landscape Architecture Store. (2025b). Nano Banana AI in design visualization. https://landscapearchitecture.store/blog
16. Benyus, J. M. (1997). Biomimicry: Innovation inspired by nature. HarperCollins. https://www.biomimicry.org/
17. Van den Brink, A., Bruns, D., Tobi, H., & Bell, S. (2016). Research in landscape architecture: Methods and methodology. Routledge.
18. Kutschera, U. (2015). Phototropic solar tracking in sunflower plants. Frontiers in Plant Science. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4701145/
19. Nguyen, P. Q., Courchesne, N. M., Duraj-Thatte, A., Praveschotinunt, P., & Joshi, N. S. (2018). Engineered living materials: Prospects and challenges. Trends in Biotechnology. https://pmc.ncbi.nlm.nih.gov/articles/PMC6309613/
20. Ahamed, M. K., Wang, H., & Hazell, P. J. (2022). From biology to biomimicry: Using nature to build better structures – A review. Biomimetics, 7(1), pp. 1-28.

Fussil Design

Cellular Automation of Cohesion Between Nature and Algorithms

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peer-reviewed conference materials

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#visual communication
#cellular automata
#morphogenetic design
#parametric design
#creative coding
#3D printed artefacts
#algorithm
#fussil

Abstract

The central focus of the master's thesis is research into the elementary elements of nature, cellular automata and their influence on design processes. Through practical experiments and a theoretical research of various cellular automata, a new design tool is created that serves to create with nature and enables the implementation of newly created artifacts in various spheres of design. The new cellular automata that are created in the process are called fussils, from the Latin words fossus (excavated) and futurus (about to be, future).

The fundamental principle for creating and evaluating research is creative programming, which I also use for experiments and the realization of design tools.

The results and their design artefacts are presented in an analogue and digital environment, which also shows the large range of patterns and shapes created in the new tool.

With the cohesion of nature and algorithm, I want to contribute to the development of new visual systems and design processes. These processes are a key part of understanding nature as a key factor in shaping new practices and artefacts of the future.

1. Introduction

Emergence. Existence. Death. Suddenly all that is around us is the constant notion of nature; one that has been following us, shaping us, creating the known surroundings from a simple matter to a complex term that we call – *life*. Our relations with it have been changed and shaped by many centuries of intertwined existence; searching for the nature of nature.

Inspired by it, not only did existence allow us to explore the macro- and microcosmos of nature, but to define our culture, identity, and design, exploiting its patterns, forms, resources, and behaviour. Nevertheless, as a part of it, yet as a separate being, we developed our own nature; numbers, letters, means of communication, and today digital systems.

Today, automation, data, and artificial intelligence have become extensions of natural evolution, mimicking and accelerating its mechanisms. These algorithmic systems, like nature itself, rely on patterns of interaction, adaptation, and feedback. Thus, the central question emerges: What is the algorithm of nature? And further: Can we design alongside it, or even within it?

The fine line may seem untouchable, yet it is crucial for designing a future that is more knowledgeable and evolves with our surroundings. This research investigates these questions by studying cellular automata — computational models that simulate the self-organizing behavior of living systems — and transforming them into

design tools. The goal is not only to represent nature through computation but to co-design with it. This concept of co-designing with nature shifts the focus from imitation to collaboration: the designer becomes a facilitator of emergent processes rather than their sole author.

The interdisciplinary nature of this work spans philosophy, biology, mathematics, and design. Concepts from Darwinian evolution, Alan Turing's morphogenesis, and John Conway's Game of Life are reinterpreted through creative programming to explore the shared logic of growth and adaptation. Each experiment is visualized both digitally and physically, emphasizing that design thinking and biological thinking are not opposites — they are parallel systems seeking form and coherence.

Rather than presenting algorithms as abstract code, the research translates them into visual and tactile experiences. Each algorithm becomes a living sketch — a designed organism capable of changing, reacting, and coexisting within its environment. These explorations culminate in the creation of the Fussil Design Tool, a platform that allows designers to interactively generate and manipulate evolving patterns, bridging the digital and natural realms.

This reasearch progresses from philosophical reflection to practical application, gradually weaving together theory, computation, and design. It begins by positioning nature as an intelligent designer and explores how biological evolution parallels algorithmic logic. From there, it moves into visual and computational experiments that translate these ideas into generative systems, forming the foundation of the Fussil Design approach. The later sections introduce the Fussil Design Tool itself, demonstrating its use as a creative instrument that allows designers to collaborate with evolving digital organisms. Finally, the study concludes by reflecting on the broader implications of co-designing with nature — rethinking authorship, creativity, and the future of design practice.

2. Nature as Intelligent Designer

2.1. Living Organism of Artefact?

To understand how nature and algorithms might be connected, the first step is to examine the very systems that nature itself produces — living organisms. By studying how life forms are structured, replicated, and evolved, we can begin to recognize the inherent logic behind their creation. These organisms act as nature's own design experiments, embodying principles of efficiency, adaptation, and self-organization. Observing them allows us to trace parallels between natural formation and algorithmic construction, offering the first insight into how design can emerge without a conscious designer.

Beyond its appearance as a familiar fruit, the orange encapsulates nature as an advanced design system [1]. Introduced to the European people in the 10th century by the Moors or Sicilian agriculture in the 9th century, we found first evidence of complex irrigation systems for growing oranges already then.

If we look at the orange, we can see that this design package [2] is carefully packed in a membrane that can sustain a bigger fall. Opened once, the membrane is soft, containing a sweet liquid substance that gives us energy, vitamins and in the end, it gives us a small package containing all the necessary ingredients to have more of it; the seed, a resource that can be reproduced an unlimited number of times – as long as the circumstances for its growth are met. This is the most advanced design system that nature has been developing over 3.8 billion of years, the systems of self-reproduction.

This natural design parallels the human act of designing: intentional composition, material optimization, and embedded purpose. Over centuries, humans have selectively bred plants and animals, altering their genetic makeup in ways that resemble industrial design processes. The orange, therefore, can be seen both as an organism and an artefact — a product of nature's evolution shaped by human intervention.

Biologist Tim Lewens captures this duality by noting that biology "finds itself in the strange position of using the vocabulary of design without recognizing an intelligent designer" [3]. In this light, natural evolution functions as a continuous process of research and development — a system of prototyping, testing, and refining, much like the work of designers.

Thus, we can say: an orange is an artefact of living nature — an outcome of countless iterations of natural design.

2.2. The Ignorant Mind

If organisms behave like designed objects, who — or what — is their designer? The answer

lies not in divine intelligence but in process itself. To answer it, we may here conceive the search with four formal causes that also present points towards the research.

- **Material cause: What is it made of?**
- **Formal cause: How is it structured or shaped?**
- **Efficient cause: Where did it originate?**
- **Final cause: What purpose does it serve?**

Applied to both artefacts and organisms, these causes help describe not only what something is but why it exists. This framework becomes a foundation for exploring how design — whether human or natural — emerges from necessity, context, and adaptation. The main contributor to this thinking was Charles Dawrin who underlined the basic foundation behind main premises that connect nature to algorithms.

2.3. Darwin's Dangerous Idea

By Darwin's revolution, his radical idea will change the course of our understanding the living world. His main idea, mostly concentrated in two primal factors of adaptation and diversity, has been described in his Origin of Species. Much like empirical reasoning, he takes the world as such and slowly digs out all the mechanisms of the past and the future. Therefore, his theorem on one side is set to prove that species are evolving, and on the other, how these processes have occurred.

Evolutionary change is driven by selective pressures. A primary example is resource limitation, where a population's size exceeds the carrying capacity of its environment, creating a competitive struggle for survival. The "crunch" time [4] presents a game of survival in which two logical points have been made by Darwin.

1. If there are no variations among the population then they will stay in equilibrium.
2. If there was a significant variation among the population then any advantages enjoyed by that population would bias the sample.

These advantages can be seen on very small scales, and an absolute tiny change would make a difference. Subsequently, if there is any strong principle of inheritance, as such that a population is more like their parents and not parents' contemporaries, these can also create traits that would be amplified over time.

The process of evolution by natural selection [5], is what will define the future centuries of all sciences. The simple principle of preservation would set a question of scale. If natural selection occurred as such, what are the smallest elements of its application?

2.4. Nature and Algorithms

The arguments Darwin proposes have two sorts of demonstrations, logical and empirical. His theory of evolution is suggesting that Design can be made without conscious designer. Instead, design arises from repetition, variation, and selection.

Nevertheless, David Dennett by the end of the 20th century, gives these logical operations a term that would best suit Darwin's explanations, calling them algorithms.

> "Algorithms are not new and were not in Darwin's day ... What is relatively new – permitting us valuable hindsight in Darwin's discovery – is the theoretical reflection by mathematicians and logicians on nature and power of algorithms." [4]

Dennett's reflection on Darwin led to a critical insight: evolution operates algorithmically. An algorithm — a step-by-step procedure for solving a problem — does not need intelligence to create intelligent outcomes. It requires only three conditions:

1. **Substrate neutrality:** The same logic can run on any medium — digital or organic.
2. **Mindlessness:** The process has no understanding of its results; it simply follows rules.
3. **Guaranteed results:** If the steps are followed, the outcome is consistent.

These qualities define both natural evolution and computational processes. In this way, algorithms become nature's double — its abstract reflection in human-made systems. Something purely mechanical can produce something seemingly intelligent, just as random mutations produce life.

The purely mindless mechanical steps of the algorithm are therefore purely automatic. These processes can only be done, by definition, as: "the workings of automaton" [4].

2.5. Nature, design without designer

For automata, evolution is triggered by "on-off" switches that create the next version of themselves. But if the nature operates through algorithmic processes, then every organism is both product and producer of design. From this perspective, humans are not outside nature, but active participants in its algorithmic unfolding.

The philosopher David Hume used a watch as an example: a pile of watch parts can't assemble itself into a working watch; it needs a designer. So, who is the designer in nature?

The human designer, by making a watch, takes his time and energy, with which he first researches the object. From ontological questions to historical, functional and esthetical ones, designers, based on research, make developments on the product and create the designed object. This research and development, as though we have first applied them to human designed products, are the basis of all organisms.

Every tiny adaptation in an organism — every change made over millions of years — is a form of natural research and development. Charles Darwin realized that this is how „design" appears in nature, not from a single dogmatic act, but through the slow, costly accumulation of small changes. This is known as the Principle of Accumulation of Design.

These accumulations appear firstly in disordered environments, where from basic rules and randomness emerged simple algorithms that started building order. The nature is ultimately a game of "order from chaos" that uses this principle of accumulation.

All of this suggests that life didn't arise from a simple mechanical process alone. It depends on the very specific laws and constants that define our universe. We might be living in a rare, perfect moment in the cosmos — a „Goldilocks zone" with just the right conditions to turn randomness into the skilled, designed appearance of life. Or perhaps it's the only kind of life we can recognize.

To visualize this complex understanding of nature, I have created a "Cosmic Glass" (Fig. 1). This glass represents our universe and contains all essential "ingredients", from simple rules that create automata to the evolution of life.

3. Evolutionary Algorithm, the Nature Doppelganger

The idea of cohesion between nature and algorithms has been experimented within the 20th century to understand nature better and its evolutionary algorithms. Trying to make these algorithms possible, Alan Turing proposed an equation that will give us insights into the important knowledge of natural patterns. Forty years later, the same question, yet in a different perspective, will be answered by John Horton Conway. By examining how evolution and self-organization can be expressed through algorithms, it becomes possible to reinterpret biological creativity as a design methodology.

To translate visually how these algorithms are being conducted, here I will be using a simple automated cell, called cellular automata. In simple terms, a cellular automaton is a mathematical model used to simulate complex systems through simple, rule-based interactions. It consists of a grid made of individual cells, each following a set of basic rules that determine how it changes over time. Although each cell behaves independently, their collective behaviour produces intricate and often life-like patterns. This principle — where simple local rules generate global complexity — forms the foundation of generative design and serves as a bridge between natural and algorithmic evolution.

Here I will be conducting visual experiments that will follow the practical-empirical scenarios of cellular automata. In this regard, the visual experiments are programmed in Java Script language – p5.js, with the help of data visualisation language, known as d3.js. These two programming languages allow us to create more complexity and present the constraints, leading to new discoveries.

3.1. The Cellular Automata

The basic logical mechanism of evolution was explored by the creation of Game of Life by John Horton Conway. The game reflects basic algorithmic choices that present the most important values of cellular automata [6]. The Game is constructed on a two-dimensional plane of pixels, where each pixel represents a single cell. Each cell in the grid has two states – on or off. These states retrospectively present the states of whether the cell is alive or dead. To contribute to its state level, each cell interacts with its neighbours in all directions.

Imagine a boundless grid composed of small cells, each capable of being in one of two states: alive or dead. At every step of the simulation, each cell looks at its eight immediate neighbours and follows these simple rules:

1. If a living cell has fewer than two neighbours, it dies — representing **isolation**.
2. If a living cell has two or three neighbours, it survives — representing **stability**.
3. If a dead cell has exactly three neighbours, it becomes alive — representing **reproduction**.

This is the only law that can be seen in Convey's game, simple enough that expresses tons of variations on form, conditions of life and movement.

To demonstrate these aspects, I created a row of cells, in which three cells are put on a horizontal line. The cell in the middle stays always alive, as it recognises two cells around it. However, the cells that are upward and downward, change their state as each one of them recognises only one neighbour alive. This formulation creates a flashing effect, as it changes itself in every next step, moving from horizontal to vertical row. The flasher (Fig. 2a), in this way, represents a unique cellular automaton, that can live forever, or until some other cells disturb the system.

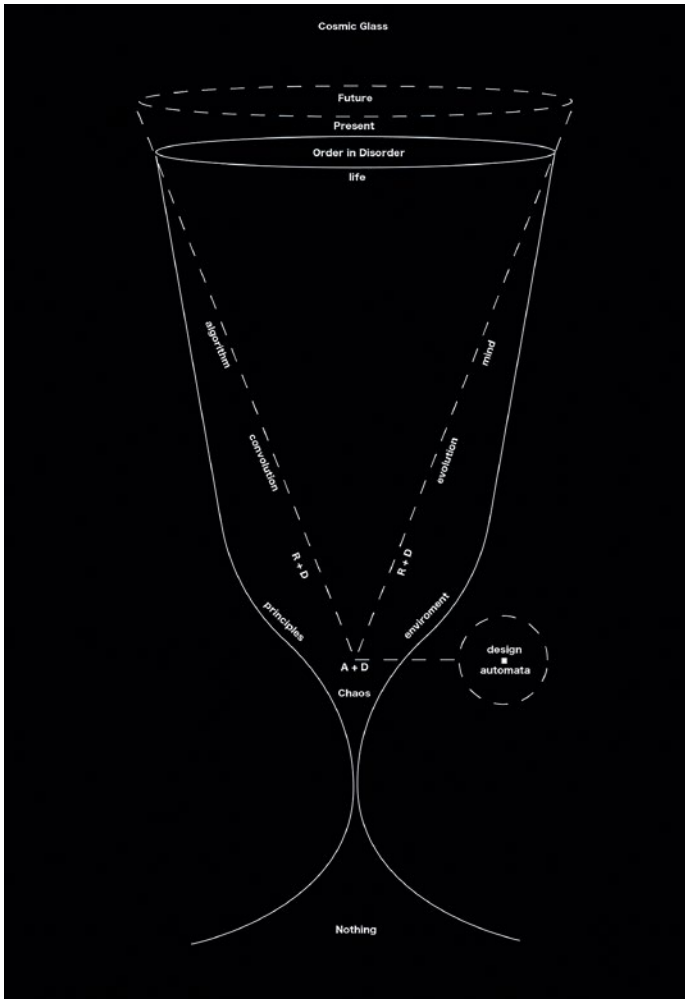

Fig. 1 Cosmic Glass, Infographic illustration. Source: Own study, Inspiration from David Dennet and Steven Hawking's Big Bang Theory.

The flasher is a set of cellular automata that belong to the larger group called oscillators. These oscillators can vary in size and type of oscillations.

Some of the cellular automata produce organisms that do not show any behaviour, or in Con-

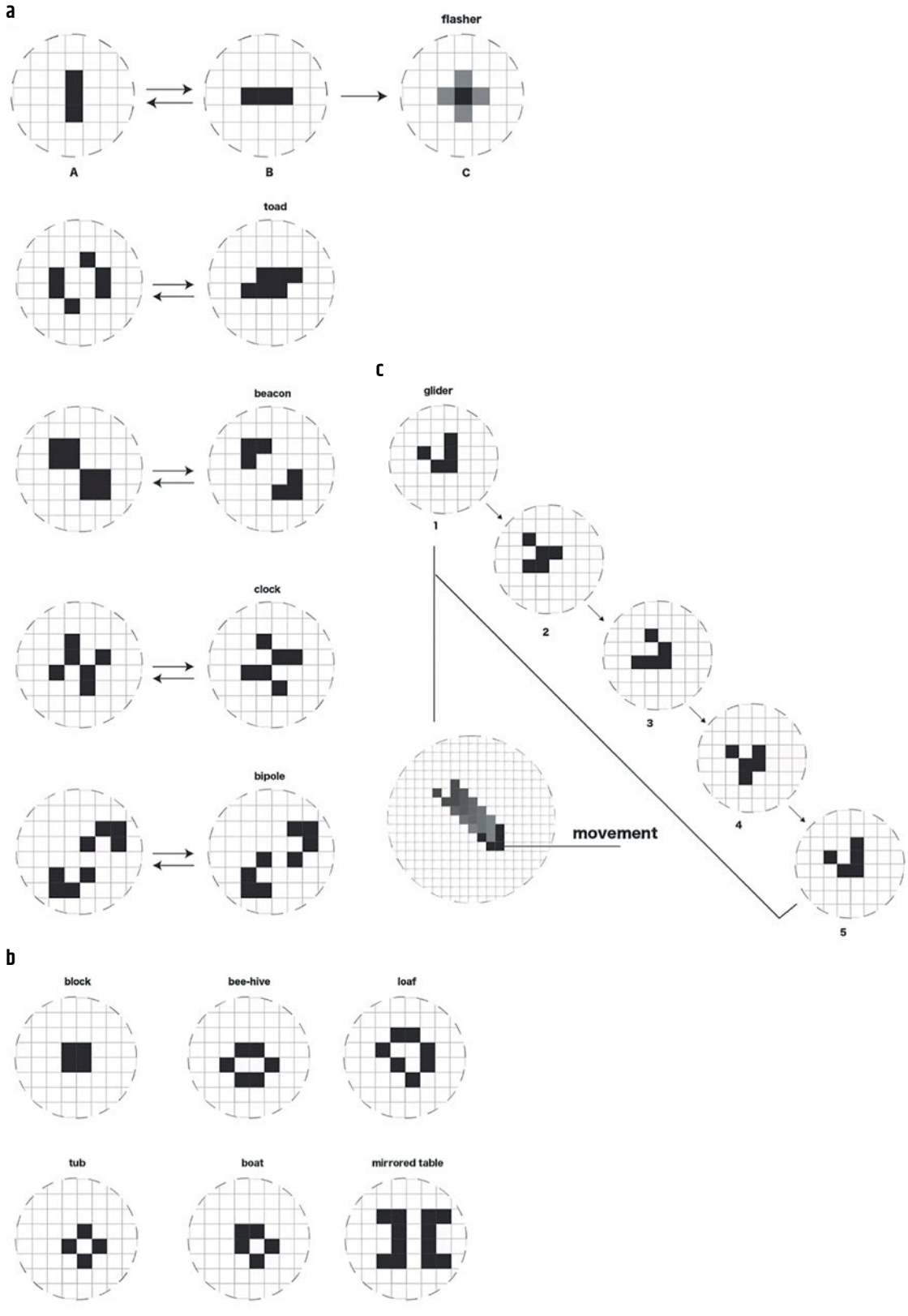

Fig. 2 John Horton Conway: Game of Life – Representation of various cellular automata.
Source: Own study, Digital Infographic.

ways example, they present special cellular automata called – still lives [6].

These are completely stable cellular automata. If they are not disturbed, they don't change their shape, nor move. The simplest type of these objects is the block. The block (Fig. 2b) is a cellular automaton created by four cells, each one of them placed next to each other in a square shape.

We have seen that these forms can be still, stable, but also, they can be unstable. By being unstable forms, they are in constant movement, changing their shape through the defined grid, until they come to an end, or are in collision with some other specimen.

These have been discovered over the decade in various forms and can be separated into a large number of subcategories. The most known version of such is a glider (Fig. 2). With five periodic oscillations, the glider can move by one pixel in a destined direction. The movement of this cellular automaton is unique as it is moving by investigating the surrounding area in each direction, more like an amoeba-like organism would move.

What is interesting about the glider and its basic shape of five cells is that no matter at what direction it moves the continuum of five cells is always following them. Belonging to the subcategory of spaceships, glider is the most basic one.

Proving that there are indefinite patterns, by which a designed object can make designs, was a crucial point in understanding Game of Life. There are communicative methods, by which cellular automata can exchange their information, thus providing new cellular automata.

Why is the Game of Life so important? Because it not just proves similarities between nature and algorithms, but because these digital systems can create their own systems. As such, a glider, by moving in one direction, can create a counter that would offer more logical gates, such as "and", "or", "not". These logical gates can make a finite state machine that would work beyond any further computation – by themselves.

Conway's Glass (Fig. 3), therefore, is a representation of how designed law creates an environment for basic mechanisms to form. It has its own life, infinity, and uncertainty.

3.2. Turing Reaction-Diffusion Systems

If Conway offered a digital logic of life, Alan Turing provided its chemical counterpart. In 1952, Turing's paper The Chemical Basis of Morphogenesis [7] sought to explain how biological forms — such as stripes, spots, and spirals — emerge from apparently uniform beginnings. His insight was that complex organic structures could result from simple chemical interactions between two or more substances, which he called morphogens. Here morphogens are representing the cellular automata, which embody the basic rules and constraints to the system.

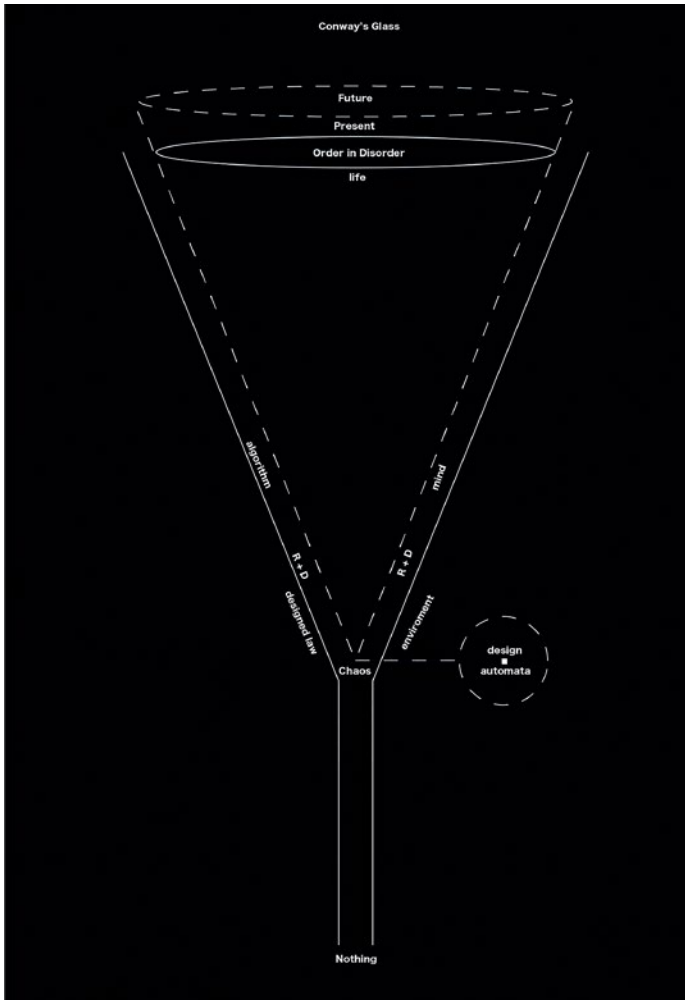

Fig. 3 Conway's Glass. Source: Own study, Infographic illustration.

The principle of application is simple: one morphogen acts as an activator, promoting growth, while another functions as an inhibitor, limiting it. The balance between these two forces — reaction and diffusion — creates stable but intricate patterns. Over time, these concentrations organize themselves into forms reminiscent of animal skins, coral reefs, or leaf arrangements.

The paper describes both mechanical and chemical processes that account in various exam-

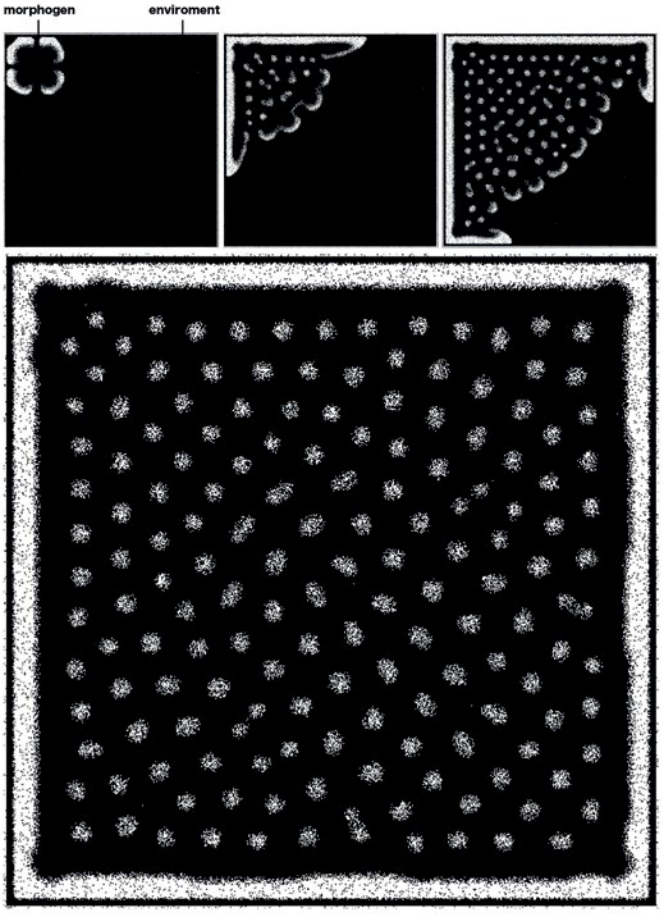

Fig. 4 Turing's Reaction-Diffusion system.
Source: Own study, digital experiment with p5.js

ples. Though it is necessary to understand that his theory, as he has written it, works in an idealistic environment, which cannot be a measure of real nature. But it gives a very basic idea of how a cellular automata can react with environment.

Here we can see that Turing was evaluating all necessary conditions that can produce more accurate results: chemical and mechanical. This is also the main distinction from Conway's cellular automata. Turing was researching not just basic automata, but rather their evolution over time with the environment.

> "In this paper it is proposed to give attention rather to cases where mechanical aspects can be ignored and the chemical aspect is the most significant" [7].

To visualise these aspects, I have created a programmed visualizations that will explain the Turing theorem further (Fig. 4). To model his reaction in my research I will be using the Gray-Scott [8, 9] model of his theory. Therefore, the tissue in our example is the environment; the grid of cells that is filling the whole space. The cellular automata that are in these environments can be put in various concentrations and are reactive with it.

By concentrations, the cellular automata are here in constant reaction with the environment, therefore exhibiting different patterns based on their diffusion and reaction rates.

> "To determine the part of the rate of change of one of these numbers due to diffusion, at any moment, one only needs to know the amounts of the same morphogen in the cell and its neighbours" [7].

By this, what Turing is suggesting is that if we have a small concentration of cellular automata, through time, this cellular automata will be spread equally in the grid forming a stable system.

In opposition to Conway, who is using a designed law, Turing has based his theory on a mathematical equation which allows a form to accumulate over time. Therefore, we are here not talking about the mechanical properties of the cell, but rather their underlying step – the communication with the environment.

The Turing's Reaction-Diffusion theory will be a part of long research after his death, proving that his mechanism doesn't just form patterns in nature, but explains how embryos and parts of the organisms are formed [10].

To translate this into computational design, we can imagine a digital canvas where each pixel represents a container of chemicals. As the simulation runs, cellular automata react, spread, and stabilize into unique formations. The pattern depends on two main parameters:

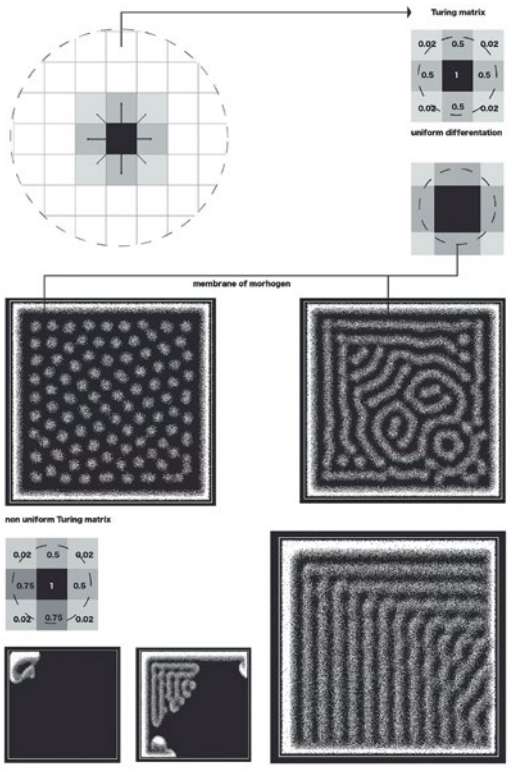

Fig. 5 Turing's uniform and non-uniform patterns. Source: Own study, digital experiment with p5.js

1. **Feed:** how much new cellular automata are introduced to the system.
2. **Kill:** how quickly existing cellular automata are removed.

The feed and kill rate are based on the reaction that is happening in the system [11]. Therefore, in this system a play of small differentiations of the rates produces various patterns in the system. These patterns are called Turing patterns. (Fig. 5)

From a design perspective, the reaction – diffusion system offers a new understanding of material agency. Instead of dictating form, the designer creates conditions under which form self-organizes. This transforms the act of design from one of control to one of collaboration — working with a system that possesses its own logic and creativity [12].

The Turing Glass (Fig. 6) forms another space [13] of observation, where the main focus is given to accumulating the right properties for making various patterns. Turing's insight, therefore, is not only a scientific one. It offers a new aesthetic paradigm: form as the outcome of feedback with environment.

4. Morphogenetic Design

Whether we describe Turing's or Conway's cellular automata, they all now represent an algorithm that possesses some designed law and principles of accumulation. As designers, these theories represent the basis of exploration on two levels, on the first level, as a designer of these algorithmic laws and on the second, a designer who controls the outcomes of these designs. The experiments that were introduced in the first and second chapter, now represent the basic core of explorative research.

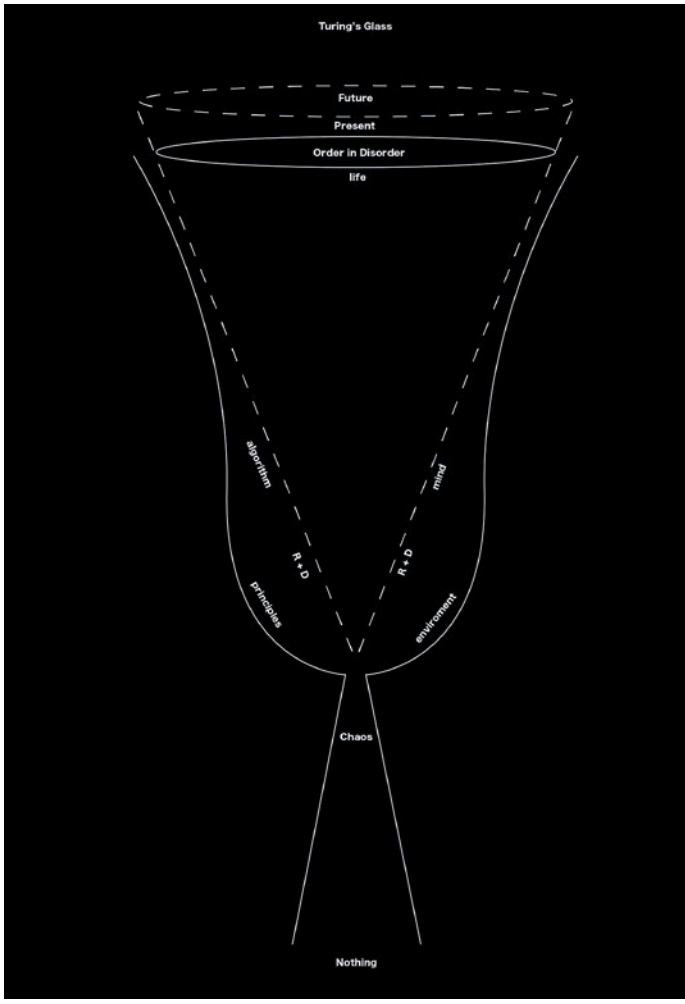

Fig. 6 Turing's Glass. Source: Own study, Infographic illustration.

Turing and Conway's system may seem very close together, but their main core is very different. The Conway's automata have a designed law, by which they detect the living cells around it, therefore observing not the actual environment but the objects inside that environment. On the other hand, Turing's automata have all components of observing the environment itself, pro-

ducing accumulative a designed pattern, but not with other objects on the environment.

To approach the complexity of natural ecosystems, the next step is to allow multiple automata to coexist and interact. To form a new general cellular automata that would present both of these components, these theories have to merge together, forming a new "morphogenetic algorithm".

In 2005, Jamie Davies proposed some key remarks on how to understand these morphogenetic algorithms and the key terms it conveys:

1. **Feedback** – Continuous exchange of information between a cell and its surroundings.
2. **Self-assembly** – Spontaneous formation of structure from initially disordered components.
3. **Adaptive self-organization** – System's ability not only to form patterns but to modify them in response to changing conditions.

> "Morphogenetic mechanisms of biology generally have another "layer" to them that provides negative feedback and adjusts morphogenetic processes to optimize them for a specific function." [14]

This algorithm is the sum of all products, presenting an cellular automaton that is defined by feedback, self-assembly and adaptive self-organisation. Given the factor of all principles, here the complexity of such an algorithm rises to a new level. With experiments, here I propose a new system of unification.

4.1. Multi-automata design system

In both Conway's and Turing's models, each automaton operates in isolation. To approach the complexity of natural ecosystems, the next step is to allow multiple automata to coexist and interact. This multi-automata design system draws inspiration from the Belousov-Zhabotinsky chemical reaction, where several substances oscillate between states of activation and inhibition [15].

When implemented digitally, the system simulates a microscopic world of competing organisms. Each type of cellular automata has its own diffusion and reaction properties, and together they form evolving ecologies (Fig. 7). Depending on their parameters, three outcomes typically emerge:

1. **Dominance:** one automaton overpopulates and eliminates the others.
2. **Equilibrium:** multiple automata coexist in balance.
3. **Inertia:** no significant interaction occurs, and the system stabilizes.

These states correspond directly to dynamics observable in natural ecosystems — growth, balance, and stasis — and illustrate how algorithmic design can mimic ecological reasoning. The system does not produce a single fixed output but a spectrum of possible

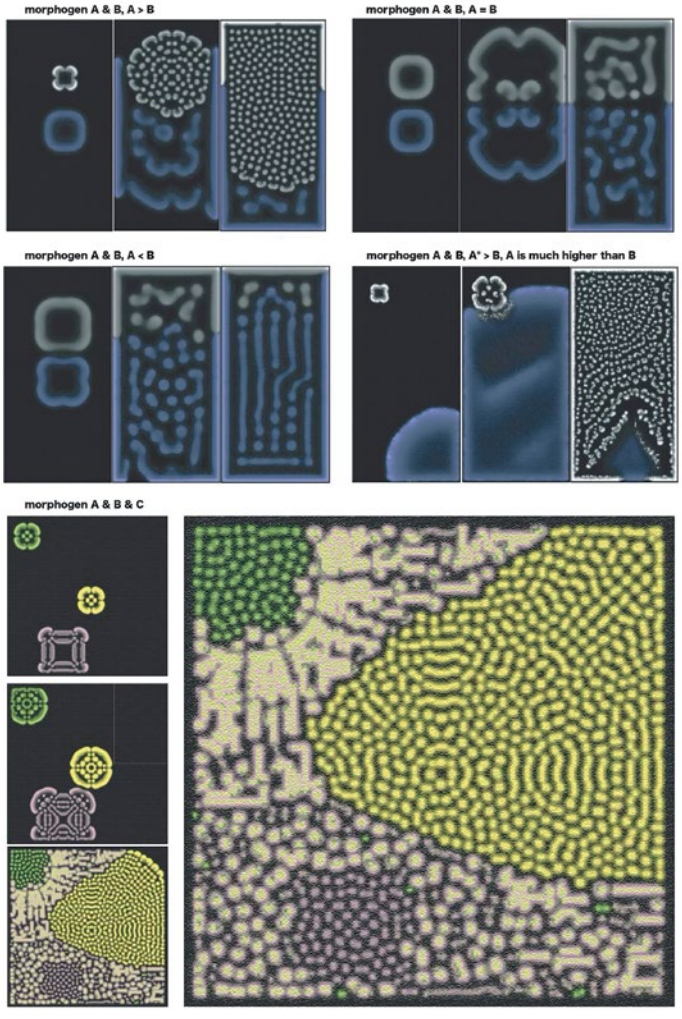

Fig. 7 Turing's uniform and non-uniform patterns. Source: Own study, digital experiment with p5.js

worlds, each representing a cross-communication between digital species of cellular automata.

For design research, this model provides a framework for morphogenetic thinking: understanding design not as the creation of isolated objects but as the cultivation of relationships. Each cellular automata becomes an actor in a broader system, and the designer's role becomes curatorial — defining initial conditions and observing how complexity unfolds (Fig. 7).

4.2. The Haptic Membrane

Nature perceives its surroundings through layers of sensitivity: skin, bark, cell wall. In computational systems, a similar function can be simulated through a haptic membrane — a zone of awareness that extends around each cellular automaton. This concept expands the classic neighbourhood model of cellular automata by introducing a variable sensing radius.

The Conway's designed law is based on eight pixels that surround a certain cellular automaton, however, to achieve a bigger radius, we use a convolutional kernel. This kernel represents a pattern of influence for each pixel around an observing cellular automaton. By controlling the scale factor of this kernel we create a larger field of perception which can form new versions of Conway's Game of Life, such as Smooth Life [16] and Lenia [17].

The scale factor determines how big the area around the cell should be considered and then the program determines the new states.

The new idea is shown, as follows:

1. If the gradient value is higher than the average, it takes the new value.
2. If the gradient is just in the middle, its state is determined by the previous value.
3. If the gradient value is below the average, it dies.

The haptic membrane transforms the grid from a rigid framework into a responsive environment. Each automaton becomes aware of gradients of change, adjusting its behaviour according to subtle variations in its surroundings. The simulation thus evolves into a living field of digital matter — sensitive, reactive, and self-organizing (Fig. 8).

This notion resonates with design practice. Just as a craftsman senses resistance in clay or tension in fabric, the haptic membrane allows the algorithm to sense and respond to contextual forces. It introduces an element of tactility into computational space — turning code into a haptic material.

5.1. The Fussils

By creating a new haptic membrane and multi--automata design system, this chapter brings the research into its design-oriented phase. Introduced by new cellular automata, the Fussils.

These cellular automata have all principles of what Dennet would describe as the principle of randomness, skill and accumulation of design, and in a new theory proposed by Davies: feedback, self-assembly and adaptive self-organisation.

To introduce fussils to the environment, I have experimented first with scale factors. The outco-

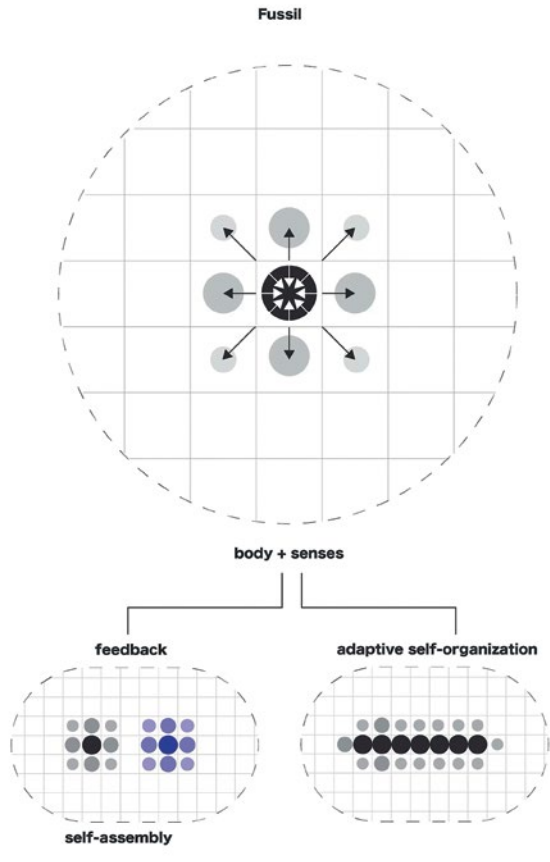

Fig. 8 Diagram representing the new cellular automata.
Source: Own study, Infographic illustration5. Fussils.

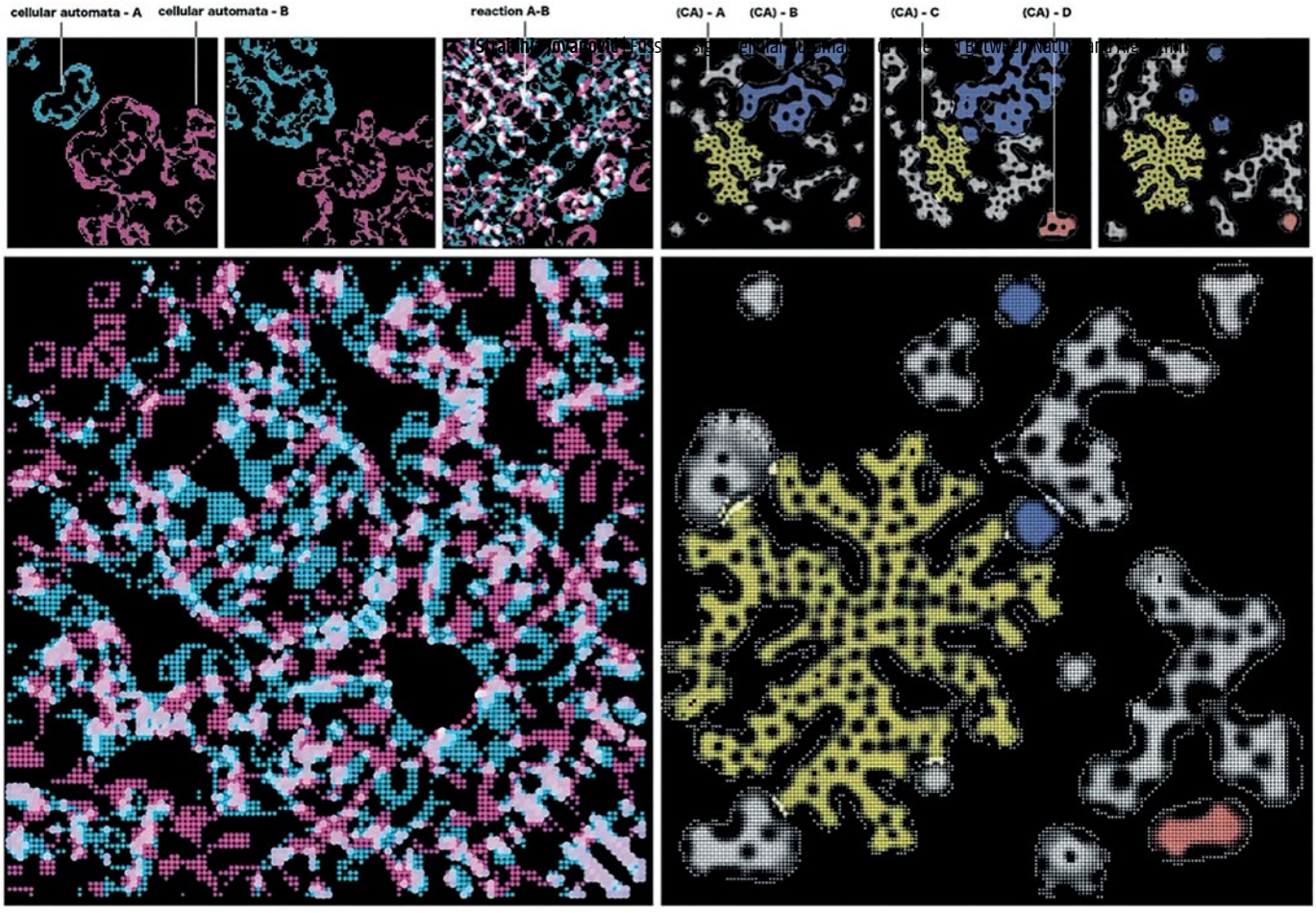

Fig. 9 Experiments with unified cellular automata, introduction of Fussils.
Source: Own study, digital experiment with p5.js

me is now very different from other automata created, as we can see more complex organisms forming. Each Fussil is not merely an element of a design, but an autonomous agent that both shapes and is shaped by its environment.

From a designer's perspective, working with Fussils is like cultivating a digital ecosystem. Rather than sketching or modelling a form, one sets initial parameters — rules of survival, growth, and exchange — and observes how they evolve into visual and structural complexity. The process resembles nurturing coral or tending a garden: outcomes are guided but never fully controlled.

The Fussils grow in real time, their structures pulsing, dividing, and recombining. Some reach stable forms; others mutate endlessly. This quality of becoming — of always being in transition — captures the essence of generative design. It mirrors nature's way of designing: through continuous iteration and feedback, not through static completion.

Visually, the Fussils can appear as swirling vortices, branching veins, or soft organic membranes. Each configuration reflects a different equilibrium between order and chaos, between attraction and repulsion. The designer, observing these forms, begins to recognize in them a digital echo of natural evolution — a reminder that computation, too, can be alive.

5.2. Fussil Reaction Design Interface

To make the system accessible to designers without requiring programming knowledge, the Fussil Reaction Design Interface was developed in p5.js and d3.js. It translates the complex mathematics of reaction – diffusion and automata into a visual and interactive environment (Fig. 10).

Here, every automaton is represented by a circle within a digital field. Its behaviour — diffusion, reaction, and energy — is controlled through sliders and buttons that modify real-time para-

Fig. 10 Fussil Design Tool. Source: Digital program with p5.js and d3.js

Fig. 11 Fussil Design Tool, example of cellular automata with haptic membrane. Source: Own study, digital experiment with p5.js

meters. The designer thus interacts directly with the generative process, observing how each change transforms the evolving system.

The main parameters are:

1. **Diffusion rate (D):** defines how far and how fast an automaton spreads its influence. A higher diffusion produces smooth gradients; a lower one preserves sharp boundaries.
2. **Reaction rate (R):** determines how strongly it interacts with other automata. High reaction rates create turbulent, energetic behaviour, while low ones result in calm and stable structures.
3. **Expansion (E):** regulates the size of the cellular automata.

By altering these values, designers perform a kind of digital choreography. Each gesture, each adjustment, sends ripples through the system, changing its rhythm and balance. The act of designing becomes temporal — more akin to conducting a piece of music than composing a static form.

The interface also allows the linking of multiple automata, enabling the creation of multi-species ecosystems within the digital field. As these entities interact, they form complex visual landscapes that resemble organic processes. The designer's role shifts from maker to observer, from controlling to listening to what the system wants to become. The Fussil interface thus becomes more than a computational tool; it is a medium of dialogue between hu-

man and algorithm, between intention and emergence (Fig. 11).

5.3. Fussil Design Tool

It is through here that we return to our primary questions, the four causes of matter, form, efficiency, and purpose. These causes determine the parameters of our Fussil Glass.

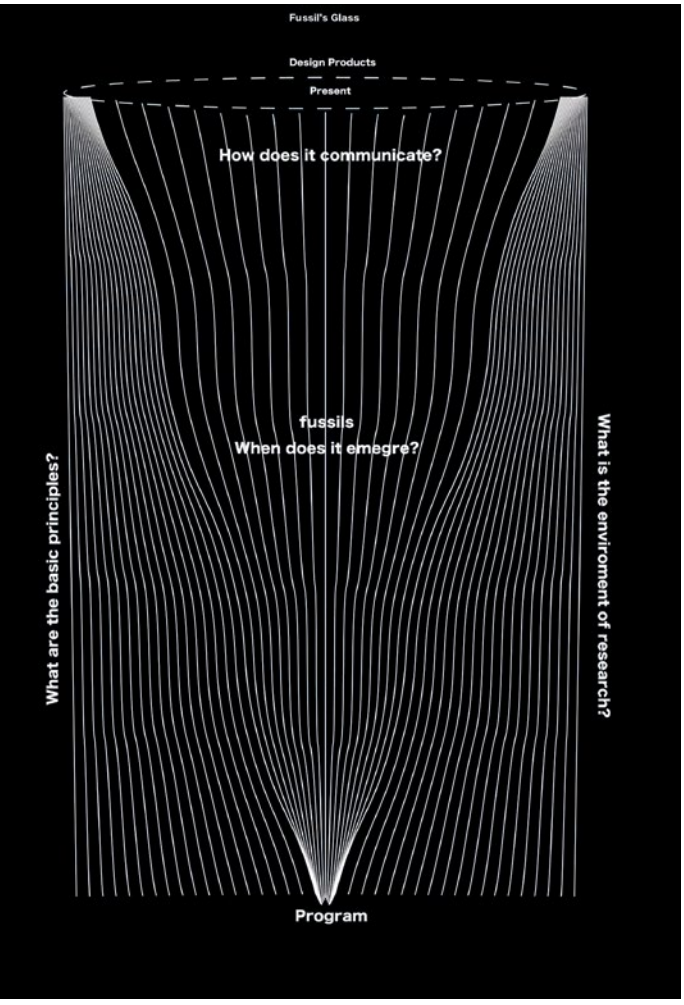

Fig. 12 Fussil Glass. Source: Own study, Infographic illustration.

What is the environment of our glass? What are the basic principles of it? When does it emerge? How does it communicate?

Fussil Glass is not deterministic, but rather explorative. We are not given the perfect conditions that will give an organism, but rather to set these conditions by ourselves and explore the designed results (Fig 12).

The designer is put on a stage of play with parameters and factors. Some factors will produce a very narrow environment, therefore fewer outcomes, and some will produce a wide range of organisms. In some cases, the environment will be overpopulated, in some cases chaotic. However, by controlling these factors we can get certain outcomes that can be implemented in our purposeful cause.

5.4. Fussil Patterns

5.4.1. Coral Fussils

The first fussil we can create is a species of coral fussils (Fig. 13). The coral fussils are set by a body and extremities that go in each direction of the environment. As time passes, they are gradually diffusing and their further shape can be observed by change in diffusion rates. For example, not only do they form a uniform body, but they can separate from one another and form a variety of automata that are populating the environment. Exploring the environment, we can see that production of new automata here is not homogenous like in Turing and Conway's example, but their process of mitosis is quite amoeba-like.

If their parameters are changed, they can transform their shapes. By lowering diffusion, the coral fossils can also form stable states over time.

5.4.2. Guppy Fussils

With the change of a few parameters, we can also explore other types of fussils. With changes in matrix and convolution we can develop more Turing oriented patterns with breathable automata. By this, the fussils are not dissolving with the environment, but are duplicating themselves to such an extent to create various natural patterns. As they resemble a lot of patterns that can be observed on guppy fishes, these fussils are named guppy fussils (Fig. 14).

One of the very interesting forms it can take is a guppy fish scale fussil. These fussils have a specific formation that can form a breathable fish scale like pattern. Constantly moving, we can see that this pattern has developed pores purely from parametric design.

The experimentation with these types of patterns gives designers a broad play with parameters. Some of the results can be quite experimental, if the parameters are changed over time.

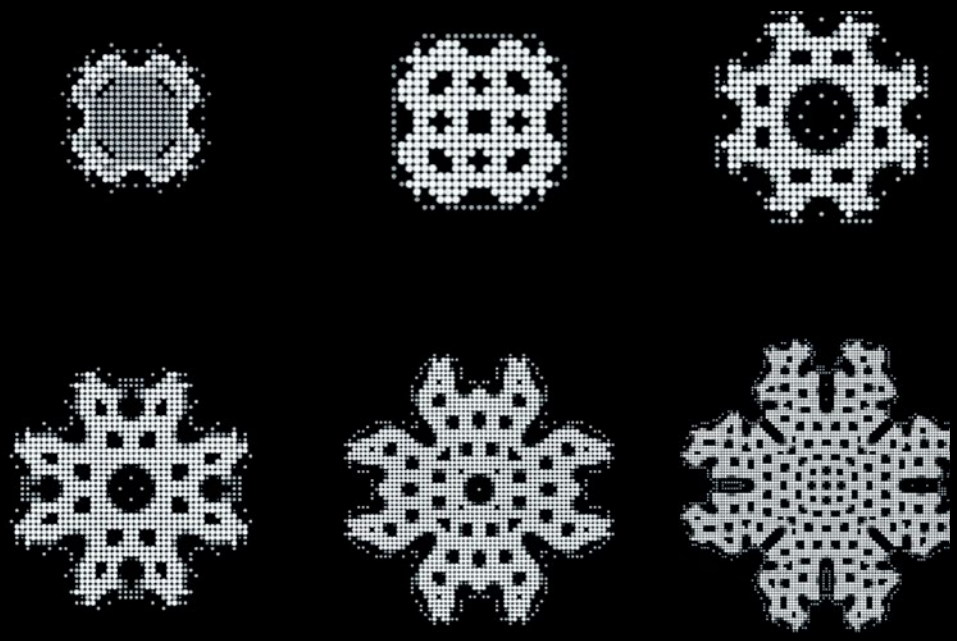

Fig. 13 Coral fussils.
Source: Own study, digital experiment with p5.js

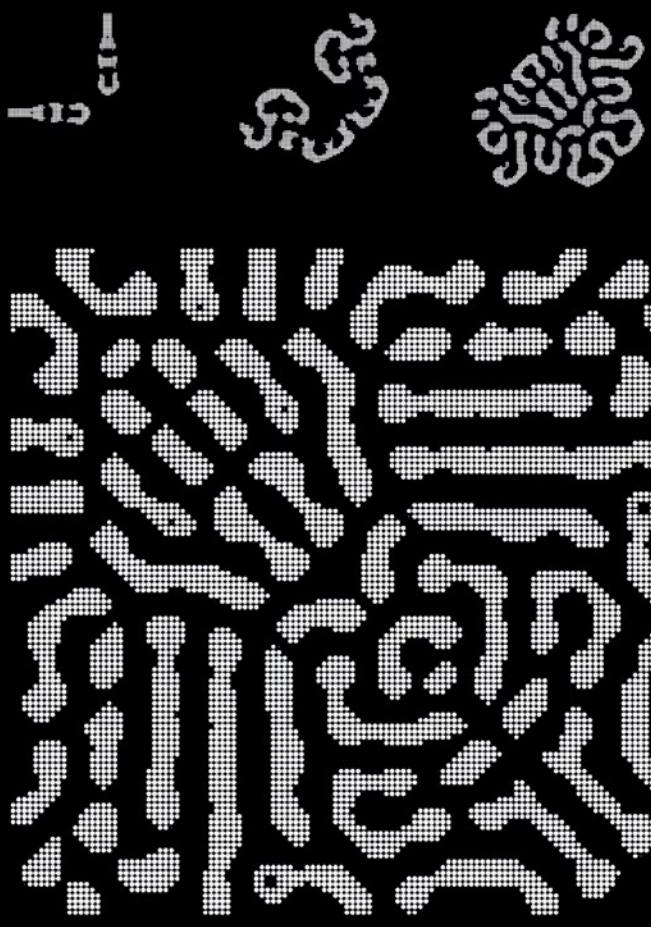

Fig. 14 Guppy textures with fussils.
Source: Own study, digital experiment with p5.js

5.4.3. Cheetah fussil

A more cohesive approach has been taken by building cheetah fussils. These fussils rapidly grow and form a uniform cheetah-like pattern. The interesting mark on these patterns is that they are indestructible. Once they grow inside the environment, they form a pattern that once disturbed it can regrow itself (Fig. 15).

Forming our matter, form and efficiency, we are now set with the final cause. Fussils enable us is to explore the purpose in two extents. We can create an environment, explore how it emerges, convolves, thus our role here would be purely explorative to see the reactions, understand the basic principles, and build new algorithms from it. The general cellular automaton is not set as an immutable algorithm, but rather as developmental.

Here we are now taking a cycle in our examination and we embed a new process of a morphogenetic designer.

1. Designing from nature: Creating morphogenetic algorithms, principles and factors of parametric design.
2. Co-designing new nature: Creating our patterns, organisms that we can control, for our various purposes. This way we are creating morphogenetic designs – the seed.
3. Implementing design in nature: Creating textures, environment, buildings, clothes with new aim and visual complexity.

5.5. The Fussil Modular Grid

While the Fussil Glass explores organic emergence, the Fussil Modular Grid reintroduces order and structure, linking generative behaviour with compositional design principles. Each pattern generated by the system can be encapsulated within a modular unit — essentially, a tile that retains its internal dynamics while connecting seamlessly with others.

When arranged in a grid, these modules interact at their boundaries, producing a secondary layer of complexity: a dialogue between local variation and global coherence. This mirrors how cells form tissues, or how individual components assemble into architectural structures [18, 19].

Designers can manipulate these modules through rotation, mirroring, or scaling, creating tessellations that shift between uniformity and diversity. Unlike conventional tiling systems, the Fussil modules are not static — they continue to evolve within their cells, generating ever-changing surfaces.

This adaptability opens pathways for numerous applications: generative textiles that never repeat, architectural panels responsive to environmental data [20, 21], or jewellery that subtly transforms over time [22]. Each outcome retains the living quality of its origin

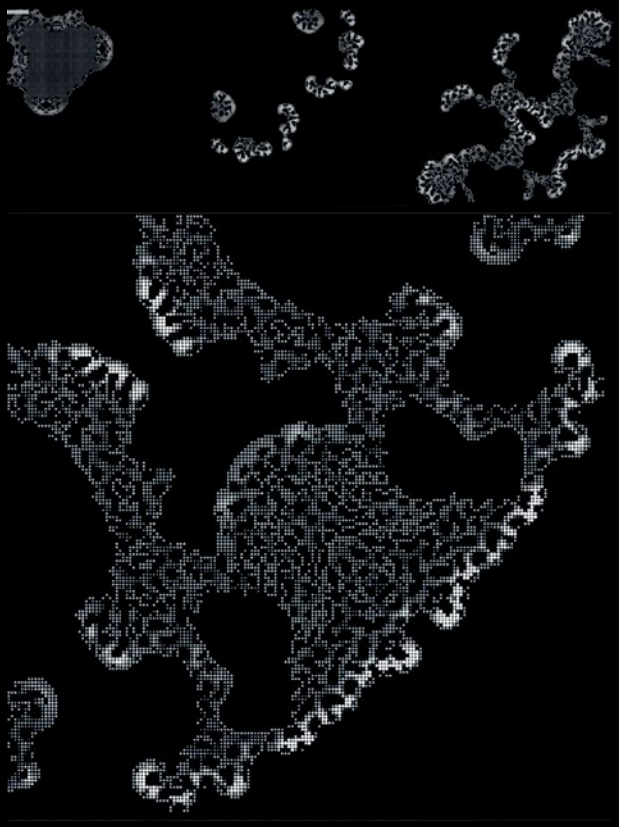

Fig. 15 Cheetah textures with fussils.
Source: Own study, digital experiment with p5.js

Fig. 16 The grid system of Fussil Deisgn Tool.
Source: Own study, digital experiment with p5.js

Fig. 17 Textile design with fussil patterns.
Source: Photography by Hana Podvršič.

— the sense that form is in motion, perpetually negotiating its own existence.

The Fussil Modular Grid thus bridges computational generativity and design pragmatism, demonstrating how living algorithms can inform not only aesthetics but also fabrication, function, and tactility.

5.6. Fussil Product

Inspired by organic architecture and cyclic processes of nature, the possibility not only lies in modular patterns, but in materials and products that incorporate these processes.

The cheetah fussil was one of the main components that lead to creation of flexible material. What makes it flexible are the holes inside the patterns that have relatively stable openings equally distributed along all axes. Therefore, when such a pattern is 3D printed, it can give more flexibility, yet not break that easily. The outcomes of such patterns can also be traced in textile materials (Fig. 17, 18).

Every seed is represented by some growth. Throughout the research and experiments, this growth has been mostly transferred to two-dimensional design space. However, as our seed contains all processes of morphogenesis, we can put all these layers on a new axis – the third axis of space. Therefore, the

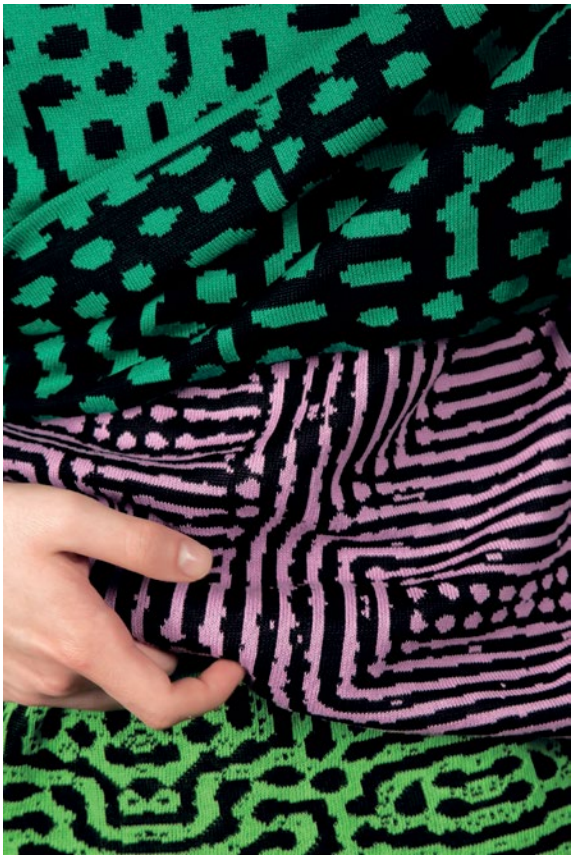

Fig. 18 Textile design with fussil patterns.
Source: Photography by Hana Podvršič.

Fig. 19 Fussil Vase: Turris.
Source: Photography by Hana Podvršič.

Fussil Tool incorporates a new design element of space-time. In this system, the layers are defined by the development of our initial design. They present the layers of time, where we embody elements of emergence, evolution and death. Put on the z-axis vertically, they now create a new space of observation, a fussil product.

There is a large variety of these products that can be created from the initial seed of design. Some of them are quite simple and uniform and some show objects of tremendous complexity. One of these forms translated into a fussil product is a vase (Fig. 19, 20). These vases, initially conceived in a virtual environment, are translated into physical reality using clay — a sustainable material that connects contemporary design with the earth itself. As both medium and metaphor, clay anchors the digital in the organic, grounding abstract algorithms in tactile form. They serve a dual purpose: as sculptural explorations of biological aesthetics and as functional objects designed for everyday life. In this way, the project reimagines the relationship between technology and tradition, proposing a future where design not only mimics nature, but meaningfully collaborates with it.

6. Conclusion

The Orange never knew what it left behind. Or maybe, it always knew what it wanted [23, 24], giving us the seed, the knowledge of its complexity, emergence, evolution, grasping into our instincts of research and creativity that would lead to investigating the primordial natural parts and its algorithm.

The 20th century was a century of pure investigation of these processes. Conway and Turing had essentially cre-

Fig. 20 Fussil Vase: Tripedala. Source: Photography by Hana Podvršič.

ated all necessary components for further examination of morphogenetic processes. The processes that would question my research and create a new way of thinking of nature. "Everything is a machine," would be argued by Gilles Deleuze and Felix Guattari in 1983 [25]. However, the information is a mutual category that can be shared by algorithms and nature, making a cohesive thought. As everything is a machine, everything is also nature.

Through the lens of cellular automata, reaction – diffusion, and evolutionary computation, Fussil Design demonstrates that the mechanisms of life and the logic of algorithms share a common ground — the generative potential of feedback.

By uniting these mechanisms into the Fussil Design Tool, this work proposes a new paradigm of creation: design as cohabitation. The designer no longer acts as a master of form, but as a collaborator with digital organisms that possess their own agency. Through interaction with the Fussil Tool, designers can explore new relationships between control and emergence, intention and surprise, authorship and evolution.

This opens new possibilities for the future of design research: responsive materials, adaptive architectures, and self-organizing artefacts that embody ecological intelligence. Each Fussil becomes a small manifesto for a new kind of making — one that acknowledges the agency of both code and matter.

To design with nature, is to recognize that we are not outside its logic but expressions of it. The orange, the algorithm, and the artefact all belong to the same continuum of evolution.

Ultimately, Fussil Design is not only a system for generating form — it is a philosophy of participatory creation, where human and non-human intelligence meet in the shared pursuit of growth, adaptation, and beauty. ■

Strahinja Jovanović

References

1. Xu Q., Nature genetics: The draft genome of sweet orange (Citrus sinensis), 2023, https://www.nature.com/articles/ng.2472 [access: 29.08.2024].
2. Munari B., Design as Art, Penguin Classic, 2019.
3. Lewens T., Organisms and Artifacts: Design in Nature and Elsewhere, MIT Press, Cambridge (MA), 2004.
4. Dennet C. D., Darwin's Dangerous Idea: Evolution and the Meanings of Life, Penguin Books Ltd, 1995.
5. Darwin C. On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life. New York: D. Appleton & Company; 1946. Quoted in: Dennett DC. Darwin's dangerous idea: evolution and the meanings of life. London: Penguin Books; 1995. p. 50.
6. Gardner M., Mathematical Games – The fantastic combinations of John Conway's new solitaire game "life", Scientific American No. 223, 1970
7. Turing A., Chemical Basis of Morphogenesis, Philosophical Transactions of the Royal Society of London. Series B Vol. 237, No. 641, 1952, pp. 37-72.
8. Pearson J., Complex Patterns in a Simple System, Science Vol. 261, 1993, p. 189.
9. McGough J. S., Riley K., Pattern Formation in the Grey-Scott Model, Nonlinear Analysis: Real World Applications Vol. 5(1), 2004, pp. 105-121.
10. Murray J. D., Mathematical Biology II: Spatial Models and Biomedical Applications, 3rd Edition, Springer, 2003.
11. Sims K., Reaction-Diffusion, 2013, https://www.karlsims.com/rd.html [access: 20.10.2023].
12. Minsky M., Papert S., Symbolistic Concept Towards Understanding Machine Learning, MIT Press, 1988.
13. Siegle E., Did the Universe have zero entropy when it first began?, Big Think, 22.02.2024, https://bigthink.com/starts-with-a-bang/universe-zero-entropy/ [access: 20.03.2024].
14. Davies J., Mechanisms of Morphogenesis: The Creation of Biological Form, Elsevier Academic Press, Edinburgh, 2005.
15. Turner A., A Simple Model of Belusov-Zhabotinsky Reaction from First Principles, Bartlett School of Graduate Studies, University College London, 2009.
16. Rafler S. Generalization of Conway's "Game of Life" to a continuous domain – SmoothLife. arXiv preprint arXiv:1111.1567. 2011. Available from: https://arxiv.org/abs/1111.1567
17. Chan BWC. Lenia: Biology of Artificial Life. Complex Systems. 2018;28(3):251-86. Available from: https://www.complex-systems.com/abstracts/v28_i03_a01/
18. Owen J., Grammar of Ornament, Princeton University Press, New Edition, 2019.
19. Studio Filippo Nassetti, Body Architecture, Parametric Architecture, 2022, https://parametric-architecture.com/body-architecture-studio-filippo-nassetti/ [access: 29.08.2024].
20. Conti M., The incredible inventions of intuitive AI, 2016, https://www.ted.com/talks/maurice_conti_the_incredible_inventions_of_intuitive_ai [access: 29.08.2024].
21. Pietila R, Pietila R. Dipoli [Internet]. Architectuul. 2019 Apr 12 [cited 2024 Mar 17]. Available from: https://architectuul.com/architecture/dipoli
22. Oxman N., A visionary of 3-D-printed fashion, MIT Press, 2014, https://neri.media.mit.edu/press/article/a-visionary-of-3-d-printed-fashion.html [access: 29.08.2024].
23. Harman G., Object-Oriented Ontology: A New Theory of Everything, Penguin Books, St Ives, 2017.
24. Latour B., Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts, in Bijker W., Law J. (eds), Shaping Technology/Building Society: Studies in Sociotechnical Change, MIT Press, 1992.
25. Deleuze G., Guattari F., Anti-Oedipus: Capitalism and Schizophrenia, University of Minnesota Press, 1983.

Ethical UX Beyond Virality

A Study of Ethical Persuasion in Community-Centric Platforms for Emerging Conceptual Artists in Comparative UK and China Contexts

Xiao Leyang

Lisa Winstanley

#Ethical Persuasion
#User Experience Design
#Platform Extractivism
#Cross-Cultural Study
#Community-embedding Platform
Reflective Practice
#Emerging Conceptual Artists

peer-reviewed conference materials

This article is based on the presentation delivered at the C-IDEA Design Conference, held on 23–26 October 2025 at Shih Chien University, Kaohsiung Campus, Taiwan, China.

Abstract

Artist-centered platforms such as Behance and Instagram have evolved from static portfolios into algorithm-driven social networks where visibility depends on performative self-branding and visual spectacle rather than intellectual depth. Regarding conceptual artists whose practice privileges ideas over objects and theoretical rigor over aesthetic immediacy, this metric-driven shift fosters anxiety, intellectual fragmentation, professional under-acknowledgement, and pressure to compromise their artistic voice [24]. For emerging artists lacking institutional buffers, these dynamics frequently result in career attrition, with many abandoning conceptual rigor for platform-legible work or exiting artistic practice entirely [14]. Despite increasing concern about platform extractivism and creative labor precarity, limited research has examined how these dynamics distinctively impact concept-first art practitioners. The study addresses that gap by proposing an ethical UX framework grounded in ethical persuasion and loyalty-driven design, moving beyond engagement-centric models to privilege conceptual depth over virality, sustained inquiry over content consumption, and intellectual community over metrics.

Methodologically, this practice-led research follows a four-phase process: (1) theoretical framework mapping, (2) self-reflexive inquiry, (3) participatory design and usability testing, and (4) evaluative framework refinement. Grounded in a cross-cultural analysis of how sociocultural ecosystems in the UK and China shape artistic identity and digital labor, the study progresses systematically from critique to construction. Through engagement with mid-fidelity prototypes, the resulting 3-pillar VRC framework translates ethical-persuasion principles into design practice: **Value**-Aligned Showcase (V) privileges concepts over visual consumption, Critical **Reflection** (R) embeds architectural slowness enabling reflective resilience and consolidation, and Upward **Community** Connections (C) creates bounded communities resisting platform scalability imperatives. This framework operationalizes abstract ethics into concrete design strategies, demonstrating that non-extractive platforms supporting intellectual flourishing are practically achievable through fundamental reorientation from extraction-based to ethical design values that nurtures authenticity and creative wellbeing.

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Xiao Leyang
Oct/2025

LIST OF GLOSSARIES

Algorithmic Visibility: The logic by which content is ranked, surfaced, or hidden on digital platforms, governed by algorithms that favor particular types of engagement (e.g., likes, shares, dwell time). These systems often influence who gets seen, when, and how, thus shaping cultural recognition and access to opportunities [1].

Emerging Conceptual Artists: Early-stage art practitioners whose work foregrounds ideas, research, and theoretical inquiry over material or aesthetic production, and who are in the process of establishing artistic identity and recognition within algorithmically mediated cultural economies.

Ethics: In the context of UX, ethics refers to the design and implementation of digital systems that safeguard user wellbeing, protect against manipulation, and support values such as autonomy, inclusivity, and sustainability. Ethical considerations include avoiding dark patterns, ensuring data transparency, and aligning platform goals with user interests [2, 3].

Ethical Persuasion: A developing concept in UX that builds upon the foundational theories of persuasive technology [4] and persuasive system design [5], but introduces a strong ethical dimension concerned with user autonomy, wellbeing, and trust. It seeks to distinguish influence from manipulation, aligning design with human-centered and value-driven outcomes. Avoiding coercive or deceptive techniques such as dark patterns, this research conceptualises ethical persuasion as the alignment of platform objectives with artists' authentic interests, articulated through four key ethical dimensions: transparency, autonomy, motivation, and value alignment.

PET Design (Persuasion, Emotion, Trust): A design methodology developed by Human Factors International (HFI), which focuses on persuasive interaction, emotional resonance, and trust-building in user interfaces. PET design combines research-based techniques to ethically influence user behavior by aligning interface design with users' psychological and emotional triggers [6].

Platformisation: The process by which digital platforms reshape and mediate economic, cultural, and social life. It refers to the infrastructural and algorithmic integration of platforms (e.g., Instagram, TikTok, Patreon) into everyday practices, often resulting in new forms of labor, visibility politics, and monetization models [7].

Trust: Trust is a relational and iterative construct guided by shared empathy, open communication, emotional awareness, and responsibility. It has both emotional (affective) and rational (cognitive) components and looks at trust as a process rather than a static state. In this study, trust is considered an essential element for sustaining authenticity, loyalty, and long-term user engagement [8].

UX Design (User Experience Design): The discipline of designing digital interfaces and systems that are accessible, user-friendly, and responsive to human needs and behavior. UX design emphasizes usability, interaction quality, and user satisfaction through iterative and research-driven processes [9].

INTRODUCTION

Research Background

Platform capitalism has systematically restructured conceptual art practice through algorithmic mechanisms that are epistemologically contradictory to intellectual work. Emerging conceptu-

al artists engaging with Instagram, Behance, and ArtStation get to confront a structural paradox: platforms designed for visual consumption cannot accommodate work whose primary medium is ideas. Algorithmic curation privileges immediate aesthetic impact over theoretical complexity, engagement velocity over sustained inquiry, and metric-based validation over discourse recognition [10, 11]. This kind of epistemological violence has contributed to the architectural erasure of intellectual labor's value through design systems that render conceptual rigor algorithmically illegible.

The consequences are measurable. Art practitioners reported cognitive fragmentation from attention architecture designed to prevent deep work [12], conceptual dilution from pressure to simplify ideas into caption-length explanations, and validation collapse as engagement metrics replace critical discourse [13]. Unlike established artists with institutional buffers, emerging practitioners lack the cultural capital to resist platform dependency, creating dual precarity: economic instability and intellectual devaluation operating simultaneously [14]. Current platform logics do not merely fail to support conceptual practice; instead, they tend to undermine the cognitive conditions and social structures rigorous thinking requires.

The counter-extractive platform architectures stand for its practicality and innovation of educational level. The central research question investigates: How can an ethical persuasion and loyalty-driven UX framework mitigate algorithmic precarity and foster epistemic sustainability of conceptual integrity, intellectual resilience, and reflective community reciprocity for emerging conceptual artists?

The study delivers three concrete contributions that address existing research gaps. First, it provides empirical documentation of platform harm mechanisms specific to conceptual artists by identifying which algorithmic logics, interface affordances, and metric architectures produce cognitive fragmentation and intellectual devaluation. Existing research generalizes 'creator anxiety' without distinguishing how conceptual artists' epistemic needs (slowness, complexity, discourse) create unique vulnerabilities. Second, it synthesizes fragmented theoretical frameworks, including persuasive systems design [4], self-determination theory [15], reflective practice pedagogy [16], and communities of practice [17] into an operational ethical UX model calibrated for intellectual labor. This moves beyond abstract ethical principles to specify concrete design patterns, interaction affordances, and algorithmic alternatives. Third, it validates feasibility through practice-led research, producing testable prototypes that prove non-extractive platforms can operationalize ethical commitments while meeting user needs. The resulting framework equips designers, institutions, and artist collectives with implementable specifications for building alternatives to attention economy platforms.

This research adopts a practice-led, design-based methodology rooted in ethical UX principles and critical design thinking. Methodologically, the research unfolds through a four-phase integrated design process, combining reflective, empirical strategies to build both theoretical insight and practical intervention:

Phase 1 maps theoretical analysis across platformisation case studies, digital self-branding, creative wellbeing, and ethical UX design principles as potential alternatives to current platform norms.

Phase 2 gathers situated knowledge through a first round of focus group interviews with six early-career artists, complemented by an self-reflexive diary that documents ideation and the development process of a functional web-based minimum viable prototype from the perspective of the artist-researcher.

Phase 3 translates the insights and design principles into mid-fi 'research artefact', which are refined through multiple rounds of usability testing and value proposition canvas exercises conducted with the same participant cohort during a second focus group.

Phase 4 continues with iterative evaluation of the prototype, integrating a critically informed position and risk management strategies, and concludes with the articulation of final insights and the delivery of a framework-ready structural design.

Employing the constructs of the design thinking method, the documentation of this research journey will be divided into four phases, each sequentially building upon the previous to provide a thorough understanding of the evolving platforms of UX regarding artists and the significance of ethical persuasion:

Phase 1: 'Preliminary Reviews & Planning'
Phase 2: 'Auto-ethnography Research'
Phase 3: 'Participant Research: Usability Testing'
Phase 4: 'Analysis & Refinement'

Ultimately, this research demonstrates that counter-extractive platforms are not utopian aspirations but achievable technical interventions requiring only commitment to different design values. Drawing on Shneiderman's [2] argument that ethical design must actively protect users from harm rather than merely avoid causing it, the framework embeds safeguards against cognitive fragmentation, intellectual devaluation, and validation collapse. The resulting prototype and specifications champion sustainable, intellectually reciprocal digital ecologies where emerging conceptual artists can develop rigorous practices without sacrificing theoretical depth, conceptual integrity, or capacity for sustained inquiry. This constitutes not incremental improvement but paradigmatic shift — from platforms extracting value from artistic labor to platforms cultivating conditions where intellectual work flourishes.

Research Questions

As aforementioned, the key research question is: How can ethical persuasion and loyalty-driven UX design mitigate algorithmic precarity and foster epistemic sustainability of conceptual integrity, intellectual resilience, and reflective community reciprocity for emerging conceptual artists, as understood through comparative UK and China contexts?

This will be addressed by the following sub-questions:

1. What pain points and value conflicts do emerging conceptual artists encounter when engaging with current portfolio and social platforms?
2. How do cultural contexts in China and the UK shape these needs and appropriate design responses?
3. What ethical design strategies or existing interdisciplinary models can be synthesized into actionable platform design principles?
4. How can principles and user research insights inform the prototype creation of concrete affordances, ethical patterns, and non-extractive algorithmic alternatives?

Research Aims & Objectives

The aims of this research are:

1. Through the design thinking method, define the current challenges that emerging conceptual artists (aged 21-26) encounter on digital platforms and identify the assumptions that underlie their pain points.
2. To critically investigate and synthesize ethical UX design strategies currently implemented (or lacking) in artist-centered platforms and multiple ethical design models, with particular focus on ethical persuasion and loyalty-driven tactics to effectively craft more ethically persuasive user experiences.
3. To propose and test an ethical design framework that provides clear recommendations, actionable guidelines for UX designers and digital practitioners to create a supportive digital environment for emerging conceptual artists.

Research Hypothesis

Based on preliminary observations and theoretical grounding, the following hypotheses are proposed. For diagnostic hypotheses, it is suggested that emerging conceptual artists experience heightened intellectual fragmentation and conceptual devaluation in response to platform environments that prioritize visual immediacy, engagement velocity, and metric-based validation over theoretical depth, sustained inquiry, and discourse-based recognition. These pressures produce intellectual erosion, including compromised conceptual rigor, reduced capacity for deep work, epistemic disorientation, and the systematic invisibility of complex theoretical labor. Conversely, artists express a growing need for digital ecosystems that enable intellectual safety, theory-centered visibility, and the preservation of conceptual integrity through reciprocal, reflection-oriented interaction models that honor slowness and complexity.

For interventional hypotheses, this study proposes that a UX-centered platform prototype, designed using principles of ethical persuasion (transparent guidance toward intellectual depth) and loyalty-driven reciprocity (mutual platform-artist intellectual growth), will be perceived by emerging conceptual artists as more supportive of sustained theoretical development, conducive to rigorous peer critique, and generative of meaningful discourse-based community than conven-

tional algorithm-driven platforms. Rather than aiming for empirical measurement of engagement or visibility metrics, the research focuses on the perceived impact of how artists intellectually develop, critically reflect, and participate in theory--centered exchange within the digital space.

The success of the proposed intervention will be evaluated through a combination of qualitative and behavioral indicators: self-reported satisfaction and psychological safety, reduced anxiety linked to self-branding, deeper engagement with non-viral, process-oriented features, and increased participation in peer-to-peer dialogue and collaborative practices.

Additional evidence may emerge in the form of active use of privacy tools, customizable features that support autonomy, and a shift toward intentional, non-competitive content sharing. These responses will collectively inform how an ethical UX framework can be both theoretically grounded and practically implemented to shape digital platforms that foster sustainable, intellectually reciprocal environments for conceptual artists.

Scope of Research

This research intentionally limits its scope by:

- Focussing primarily on emerging artists rather than mid-career or established creators, as the targeted individuals often face heightened vulnerability and dependency on platform exposure.
- The range of emerging artists (21-26 years old) is chosen to reflect a transitional life stage in which many artists are navigating the shift from education to professional practice.
- The study is not a large-scale quantitative study but a qualitative, design-led inquiry, emphasizing depth of insight over generalizability.
- It does not evaluate all existing platforms exhaustively; instead, it focuses on a critical analysis of dominant patterns and mechanisms that represent broader trends in persuasive and extractive design.
- While the research touches on psychological effects such as anxiety or burnout, it does not attempt a clinical or diagnostic assessment of mental health.
- The study proposes a design prototype as a mid-fi conceptual research artefact under the comparative UK and China contexts rather than as a fully functional commercial product.

The boundaries are set to maintain focus and to allow for methodological depth. The scope ensures that the expected findings can remain relevant and actionable for both scholars and practitioners.

LITERATURE REVIEWS

1. The Digital Transformation of Artistic Labor

The COVID-19 pandemic accelerated a transformation already underway: digital platforms have fundamentally restructured how artists develop careers, build audiences, and sustain creative practices. What began as supplementary promotional tools, artist social media or websites serving as digital business cards, have evolved into essential infrastructure shaping every dimension of artistic life [18]. Platforms like ArtStation, Behance, Instagram, and Dribbble compete for artists' attention, each promising visibility, community, and professional opportunity. This proliferation, however, has not democratized artistic careers as promised. Instead, it has reconfigured new forms of gatekeeping, anxiety, and intellectual compromise that disproportionately affect the development of artists.

1.1. Platformization and Algorithmic Gatekeeping

While platforms claim to liberate artists from traditional gatekeepers — galleries, curators, institutions — they have erected new barriers equally opaque. They have introduced new gatekeeping mechanisms through algorithmic curation systems that prioritize engagement metrics over artistic merit [13, p. 1315]. This shift exemplifies what Nieborg and Poell [19] term 'platformization': the process whereby digital infrastructures actively govern creative production through metric systems and engagement optimization.

Untransparent algorithms of governance re-determine visibility through logics that systematically disadvantage conceptual work. Content is driven by unseen mechanism and virality, not depth or theoretical rigor [20]. While visual spectacle and immediate entertainment pleasure outperform intellectual complexity in recommendation feed, the system has already been optimized for the 'poor image' [21], prioritizing circulation over contemplation. This produces concept devaluation: the algorithmic erasure of theoretical complexity in favor of platform-legible content of likes and shares.

More critically, platforms cannot assess conceptual sophistication. Algorithmic systems

measure behavioral signals, such as watch time, engagement rates, sharing patterns, but not intellectual rigor or theoretical contribution [11, p. 169]. This produces structural misalignment between art's epistemological values and platform reward systems. Work requiring sustained intellectual engagement, theoretical literacy, or contextual framing to activate meaning is systematically disadvantaged regardless of its critical contribution [22, p. 27]. The intellectual labor foundational to conceptual practice of theoretical reading, philosophical inquiry and critical discourse remains invisible within platform architectures designed to showcase visual production.

1.2. Visibility as Pathology: A Compromise

What faced by artists became an inescapable structural tension: platform visibility has become mandatory for professional legitimacy, yet not necessarily associated with intellectual documentation. Artists find limited alternatives and vulnerability to entry, which leads to a visibility dilemma: they must choose between accepting platform compromise or risking professional marginalization.The choice, however, proves illusory: lacking the institutional capital established artists possess, emerging practitioners have no viable alternative to platform participation [14, p. 283]. They cannot afford invisibility.

The compromise manifests through what Marwick and Boyd [23] identify as 'performative self-branding': artists transform themselves into algorithmically legible content producers, prioritizing platform presentation over conceptual development. Accordingly, Duffy [24] characterizes this as 'aspirational labor' describing the unpaid work of cultivating platform presence under perpetually deferred promises of recognition. This operates eventually through what Bucher [1] identifies as 'algorithmic imaginaries': artists develop folk theories about platform preferences, pre-emptively modifying practice to conform with perceived algorithmic demands. This pervasive self-censorship resulted in complex conceptual investigations being often abandoned for work promising visual appeal and greater visibility [13].

Sustained engagement with value-misaligned practice and systematic dilution of conceptual rigor produces significant psychological consequences. The cognitive dissonance inherent in platform participation — wherein artists intellectually recognize that virality does not indicate conceptual rigor yet experience daily metric feedback suggesting otherwise — generates what can be characterized as legitimacy crises [25]. When engagement metrics function as proxies for artistic worth, artists navigate constant tension between their understanding of conceptual value and platforms' assessment mechanisms.This tension manifests as chronic anxiety, self-doubt, and what clinical literature identifies as impostor syndrome: the internalized belief that one's work lacks value despite evidence of competence. Duffy and Wissinger [26] observe that this creative anxiety becomes characteristic of platform-dependent practice, as artists increasingly internalize platform logics as self-assessment criteria. The result is not merely temporary stress but structural psychological precarity. Even though artists understand intellectually that platforms misvalue their work while experiencing perpetual evidence suggesting their practice fails to meet success indicators. Over extended periods, this cognitive dissonance erodes confidence in one's artistic identity and conceptual rigor.

Viewed through evidence points, while 'online presence' has become mandatory, there exists a blank in platforms' infrastructure to support artists' artistic identity formation. Lost in the pressures of performative branding, metric-driven success indicators, and polished self-presentation, artists risk compromising their long-term development. Platforms require intervention to facilitate spaces that nurture epistemological values and employ non-extractive methods to foster sustained engagement rather than frustration.

2. Emerging Conceptual Artists as a Distinct User Population

Conceptual artists constitute a specific population navigating today's platform-dependent cultural production, wherein the emotional costs of visibility, intellectual compromise, and economic survival converge. Although aware of algorithmic demands, their creative intent originates from theoretical inquiry rather than platform optimization. They experience persistent tension between maintaining visibility and preserving conceptual integrity, often choosing intellectual rigor over algorithmic legibility when forced to decide.

2.1. Defining the Group: Practice, Identity, and Epistemological Integrity

In this study, conceptual artist refers to practitioners for whom ideas precede and supersede execution, where individuals construct artistic identity through intellectual inquiry, theoretical engagement, and concept-driven work [27, 28]. This encompasses diverse practices including installation, performance, social experimental practice, institutional critique, text-based work, and durational art. Upon that, although I have attempted to distinguish the blurred lines between 'commercial' and 'conceptual' fine art [29], research shows that monetisation remains an inevitable part of artists' livelihoods. This research focuses on artists for whom intellectual integrity and conceptual rigor take precedence, adopted from Bridgstock's [30] framework of 'creativity-first' orientation wherein economic aims remain subordinate to artistic values. Commercial strategies, when employed, function as means to sustain conceptual investigation rather than primary objectives.

The choice to focus on conceptual artists, as distinct from the broader category (Table 1) of 'visual artists', 'designers' or 'creators' or 'AI automated image makers', rests on the fact that self-identified artists often operate with heightened identity attachment to their practice, and greater exposure to labour precarity, public evaluation, and structural marginalisation [31, 32]. While designers prioritize problem-solving and creators optimize for engagement, conceptual artists pursue work fundamentally rooted in theoretical depth and critical inquiry. This renders them particularly vulnerable to platforms' structural inability to assess or reward intellectual sophistication.

2.2. The Psychological Precarity of Intellectual Work

Multiple studies confirm that artists experience elevated rates of anxiety and depression compared to general populations. A 2023 survey by Changing Arts and Minds documented that 62% of creatives self-reported anxiety and 44% depression, with the sector's overall mental health risk three times that of general population [33]. For conceptual artists specifically, these risks intensify due to the cognitive demands and emotional investment required for sustained intellectual work. Unlike designers following functional briefs or creators optimizing engagement, conceptual artists pursue intrinsically motivated inquiry requiring theoretical depth, philosophical engagement, and critical thinking — forms of labor platforms structurally devalue.

Tab. 1 Comparative Overview of Creative Groups in Key Categories.

Groups	Motivation	Output	Platform Use
Conceptual Artists	Theoretical inquiry, critical thinking, idea development	Concept-driven work requiring contextual framing	Algorithms cannot assess intellectual rigor; visual reduction erases meaning
Visual Artists	Aesthetic exploration, material experimentation	Image-based work with immediate visual appeal	Platform-compatible but may face oversaturation
Designers	Problem-solving, clarity, UI/UX styles, logic, usability	Functional solutions, product design, feasibility flows	Optimize for usability, aesthetics, branding, outcomes
Brand Creators/ Influencers	Visibility, story-telling, content, monetization	Aesthetics, market-driven work	Metrics-first, quality content, short reels, "hooks", dissemination
AI Automated Image Makers	Speed, novelty, viral impact	Auto-generated visuals	Trend-surfing or mimicry, advanced database, innovation experimentation, productivity

Source: Own Work.

2.3. Redefining Primary Needs: From Visibility to Value

Emerging conceptual artists are not seeking yet another efficiency-maximised visibility machine. What they fundamentally require is a more holistic and durable ecosystem of support in which prioritises not only exposure, but also mental wellbeing, professional sustainability, and resilience. What emerging they fundamentally require therefore articulate 4 intertwined needs: (1) Sustainable intellectual opportunities that bolster conceptual confidence, provide access to critical discourse networks, curatorial recognition, and meaningful pathways into institutional and theoretical conversations rather than purely commercial visibility; 2) Safe community zones for trial-and-error, where failure is tolerated and critique is paced by cool-down periods; (3) Quality feedback and upward social ties that replace like-driven validation with informed dialogue; and (4) Slow, contemplative, and value-aligned expressions that accommodates concept-first expressions and encourage sustainable research practice over episodic virality.

These needs imply fundamental reorientation from user-centered efficiency to value-centered design ethics. Rather than optimizing for engagement, platforms must embed the intellectual friction, which is considered as intentional design decisions making audiences pause, read, and think. Attention should be earned through depth rather than dopamine loops. For early-career conceptual artists, what proves most necessary is not exposure but resilient infrastructure for intellectual belonging, theoretical reflection, and intellectual community — systems supporting the thinking that defines their practice rather than demanding its simplification for algorithmic legibility.

3. Ethical UX Design: Values, Power and Responsibility

Ethics in platform design cannot be neutral. As Sections 1-3 demonstrated, current systems systematically privilege engagement over intellect, circulation over contemplation — choices that constitute ethical positions whether acknowledged or not. Any intervention addressing these structural biases requires grounding in what ethics means when intellectual work is at stake.

In classical philosophy, ethics is the inquiry into moral principles that distinguish right from wrong [34, 35]. Scholar Buwert [36] mentioned in 'Ethical Design: A Foundation for Visual Communication' that "The ethical [is] a mode of existence characterised by sensitivity to and recognition of qualitative differences between experienced potentialities." In his perspective, ethical design is not a special category of 'good' projects, but the recognition and responsible steering of the inherent power. Upon that, design theorist Clive Dilnot [36] in authentic design ethics research further points out the danger of constructing an insular discipline specific conception of ethics:

> ...we cannot simply develop a cozy set of design-ethics that will swaddle current practice in a cocoon of easy moral probity (much like "green architecture" attempts with current building practices). What we need in fact is an ethics – or an ethical principle – that is, at the same time, adequate as ethics per se.

Translating those definitions into platform design for conceptual artists means asking how interfaces and algorithms can be systematically deliberate, transparent, and value-aligned to enlarge rather than constrain intellectual capacity. Each visual, behavioral, and algorithmic choice should serve users' informed intellectual interests — not platform revenue optimization. As Berman [37] argues, designers function as gatekeepers of culture, their decisions shaping what forms of cultural production become structurally viable. This positions ethical responsibility beyond avoiding harm: designers must actively reject dark-pattern manipulation while cultivating conditions enabling sustained theoretical thinking, conceptual experimentation, and intellectual community.

However, understanding ethics framed with ostensibly good intentions can still enable manipulation. Practitioners Chris Nodder and Harry Brignull further sharpened the lens and drew a clear line by establishing precise boundaries. As Nodder cautions in Evil by Design, persuasive UX crosses into unethical territory when it weaponizes social proof, for instance, by displaying fabricated or selectively curated product reviews to manufacture false popularity and urgency, thereby manipulating trust to increase conversions [38]. The ethical threshold crystallizes where design transitions from facilitating informed choice to systematically exploiting psychological factors.

4. Toward Ethical Intervention: Theoretical Frameworks for Platform Design

The challenge of designing platforms supporting rather than exploiting conceptual artists requires

synthesizing theoretical frameworks across behavioral psychology, motivation theory, and user experience design. This section examines how established models and other motivational frameworks can be adapted from their original contexts (health behavior change, consumer engagement) to address the distinct requirements of intellectual work in the artist community.

4.1. Persuasive Systems Design: Defining Ethical Boundaries

Persuasive Systems Design (PSD) is an established theoretical framework in the UX field that provides foundational principles for technology influencing user behavior 'without coercion, compulsion, or force' [4, 5, p. 485]. The framework distinguishes voluntary persuasion from manipulation, requiring designers to analyze intent, context, and strategy before deployment. Benner et al.'s [39] systematic review identifies six ethical conditions for legitimate persuasion: Awareness, Outcomes, Choice, Autonomy, Transparency, and Motivation (Table 2). When these conditions are satisfied, PSD demonstrates measurable benefits including higher engagement, reciprocal relationships, and enhanced trust.

Compiling results from review sections of ethics and creative practicality, 4 strong-related value propositions for ethical PSD are applied and foregrounded across the practical component of the research: P2 Outcomes, P4 Autonomy, P5 Transparency, P6 Motivation. *[This study will intentionally exclude Proposition 1 (Awareness) and Proposition 3 (Choice) from its evaluative framework, as the research paradigm is inherently predicated on conscious participation and voluntary decision-making. By design, all experimental conditions require baseline awareness and explicit opt-in mechanisms, making these variables constants rather than testable parameters in the current investigation.]*

However, when the basic assumptions of PSD are inconsistent with the requirements of intellectual work, merely choosing the appropriate propositions is insufficient. The PSD framework developed to change health behaviors (such as increasing exercise and adhering to medication) assumes that behaviors can be isolated, measured and gradually changed through targeted intervention measures [4, 5]. The development of the concept shows contradictaries of the logic. Intellectual work is carried out through nonlinear processes: extended theoretical reading does not produce visible outputs, conceptual dead ends constitute productive inquiries, reflective pauses contribute to the consolidation of cognition, and iterative experiments require tolerance for ambiguity. The behavior-centered focus of PSD – triggering discrete and measurable actions – must be fundamentally reconceptualized to adapt to situ-

Tab. 2 Overview of Ethical Persuasive Design Proposition Table.

No.	Name	Sort description	Origin
P1	Awereness	Importance of developer and designer awereness for applying PSD	L1, I1, I7
P2	Outcomes	Alignment of outcomes with ethical and individual concerns and needs	L2, L4, L5, I1, I5, I8
P3	Choice	Consider users' needs when designing the choice architecture	L7, L4, L5, I1, I5
P4	Authonomy	Provide freedom and autonomy, use opt-in design	L3, L5, I2
P5	Transprency	Balance transparency between users' needs and PSD effects and effectiveness	L2, I1, I2, I4, I5, I6
P6	Motivation	Choose PSD elements that do not foster immortality but provide aesthetically motivating design	L6, I3, I4, I6, I8

Source: [39, p. 564].

ations where the goal is not behavioral change but cognitive ability maintenance: the sustained attention, intellectual risk-taking spirit and intrinsic motivation that the protection platform typically weakens. This re-conceptualization requires studying how the relevant behavioral and motivational frameworks address (or fail to address) the different needs of intellectual work.

4.2. Comparative Framework Analysis

In the domain of behavior change and persuasive design, several models have been assessed and investigated in research and practicality. This analysis examines 9 prominent user experience and behavioral modification models: particularly Fogg's Behavior Model (Fig. 1), Self-Determination Theory (Fig. 2), and ARCS model (Fig. 3), while juxtaposing them with critical viewpoints that challenge strictly efficiency-driven design paradigms. A detailed framework & model analysis table 2 is documented as comprehensive takeaways of the research. By comparative analysis, the existing behavioral frameworks thematically address four domains critical for platform design: motivation, autonomy, competence recognition, and temporal structure (Tab. 3).

4.2.1. The Intrinsic-Extrinsic Motivation Paradox

A central tension across behavioral frameworks concerns motivation's source and sustainability. Fogg's Behavior Model [40] treats motivation as a measurable variable enabling triggered actions, assuming higher motivation increases behavior likelihood. Conversely, Self-Determination Theory [15] distinguishes motivation types: intrinsic (inherent interest) versus extrinsic (external rewards), arguing extrinsic motivators systematically crowd out intrinsic engagement, particularly for creative tasks requiring cognitive flexibility [41, p. 659].

This proves critical for conceptual artists. While reviews documented platform engagement metrics driving behavior, SDT predicts this outcome: continuous metric feedback shifts motivation from "does this concept interest me?" to "will this get engagement?" — the cognitive colonization observed. Keller's [42] ARCS model attempts synthesis by emphasizing intrinsic satisfaction, yet its attention-capture mechanisms risk replicating platform capitalism's attention extraction.While SDT theorizes motivation crowding, the ethical

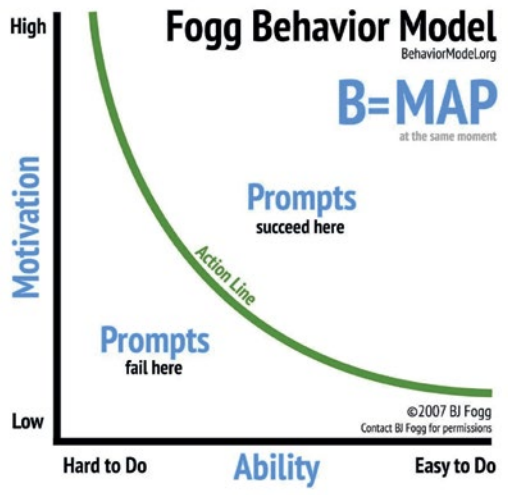


Fig. 1 Fogg Behavior Model. Source: [43].

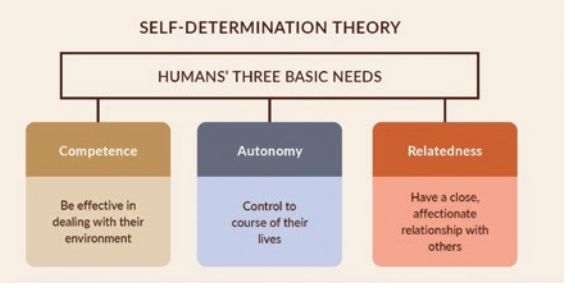


Fig. 2 Overview of Self-Determination Theory. Source: [44].

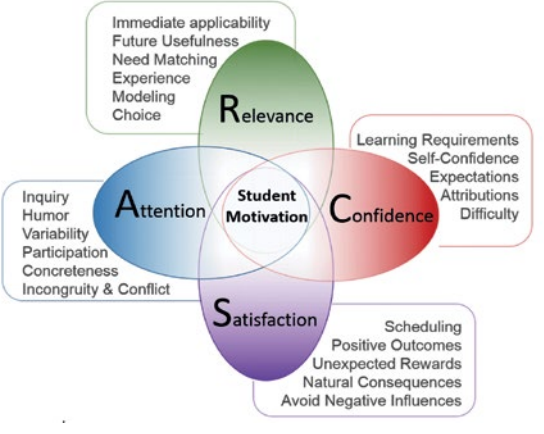


Fig. 3 Overview of ARCS Model. Source: [45].

Tab. 3 Framework Model Analysis Table.

#Model_ Name	Brief_ Description	Components	Key Words	Benefit	Limitations	Ethical Considerations	Industry_ Applications
Reasoned-Action Theory	Suggests that people's intentions predict behavior, influenced by attitudes and social norms	Behavioral intention, attitudes toward behavior, subjective norms, perceived behavioral control, actual behavior execution	#Changes of Attitudes #Relationships	Strong predictive power for planned behaviors, useful for intervention design, applicable across cultures	Relies heavily on self-reported intentions; does not fully account for perceived behavioral control	Must account for social pressure, cultural bias, and the challenge of self-reporting	Education, Healthcare, Marketing, Organizational Change
ARCS Model (Motivational Design Theory)	Framework for designing learning experiences that enhance motivation and engagement	Attention, Relevance, Confidence, Satisfaction, motivational strategies, engagement techniques	#Effective Learning #Engagement #Expectancy-value theory #Instructional Design #Motivation	Enhances learning engagement and student motivation; structured educational design	Doesn't guarantee learning retention; may not suit all learning styles	Ensure motivation techniques serve meaningful learning outcomes	Corporate Training, Digital Media, E-learning, Education, Organizational
Elaboration Likelihood Model (ELM)	Describes how people process persuasive messages via central and peripheral routes	Central vs. peripheral routes, message quality, source credibility, audience motivationv	#Change Someone's Mind #Changes of Attitudes #Decision-Making #Effective Communication #Persuasion #Processing Stimulus #Social psychology	Framework for persuasive messaging; predicts effectiveness; adaptable	Can oversimplify decisions; peripheral route risks shallow persuasion/ misinformation	Responsibility in using peripheral cues; avoid manipulation	Digital Media, Marketing, Mass Media, Political, Social Appeals
Hook Model	Behavioral design framework explaining how products form user habits through trigger-action-reward cycles	Triggers, Action, Variable Reward, Investment, Habit Formation Loop	#Addiction #Digital Habits #Engagement #Habit-forming #User Mental Model #'Hooked'	Creates habit-forming products; boosts engagement and retention	Can lead to addictive behaviors if misused	Must avoid harmful addiction cycles	Education, Retail, Technology
Mayer's Multimedia Learning Principles	Research-based principles for designing effective multimedia learning experiences	Multimedia, Contiguity, Modality, Redundancy, Coherence, Personalization, Embodiment, Segmenting, Pretraining, Signaling	#Attention #Digital Learning #Emotional Engagement #Interactive Learning #User Experience	Reduces cognitive load, improves learning outcomes	Focuses on cognitive aspects; may miss emotional/ motivational factors	Support genuine learning, not just engagement metrics	Education, Healthcare, Technology
CHOICES Framework	Explains how people make choices based on cognitive biases and heuristics	Context, Habits, Other People, Incentives, Congruence, Emotions, Salient	#Decision-Making #Motivation Persuasion #Trust Social Psychology	Structured understanding of decision-making; improves choice architecture	May oversimplify and ignore cultural contexts	Respect user autonomy, avoid manipulative nudging	E-commerce, Environmental, Finance, Healthcare, Retail
PET Model	Framework for persuading users using emotion and trust in digital design	Persuasion, Emotion, Trust	#Decision-Making #Motivation Persuasion #Trust Social Psychology	Builds trust, enhances engagement and conversion	May oversimplify and overlook cultural differences	Avoid manipulative dark patterns	E-commerce, Education, Retail, Social Media, Technology
Fogg Behavior Model	Explains behavior as a result of motivation, ability, and a trigger converging	Motivation, Ability, Trigger	#Accessibility Action #Behavioral Theories #Friction Habit-Forming #Motivation Persuasion #Simplicity Triggers #User Experience	Clear framework for behavior design; reduces friction; increases conversions	Best for simple behaviors; lacks depth for complex change	Avoid manipulation; ensure alignment with user goals	Behavioral Science, E-commerce, Fintech, Healthcare, Retail, UI/UX

Source: own work.

framework should introduce the mechanism of how to protect intrinsic motivation from platform-native extrinsic reward systems. Conceptual artists require not merely balance between intrinsic/extrinsic motivators but systematic consultation or customised prompting guidance from metric-based validation corroding intellectual engagement.

4.2.2. Meta-autonomy Beyond Choice

Autonomy was highlighted among patterns. PSD's Proposition 4 mandates users retain meaningful choice over system influence [39, p. 564]. SDT positions autonomy with self-direction and volition, which is as psychological need foundational to wellbeing [15, p. 227]. ARCS's relevance dimension requires aligning system goals with user objectives [42]. However, assessessing them implies that frameworks that is developed for commercial contexts define autonomy narrowly: choice among platform-provided options (notification preferences, privacy settings, feature toggles). For conceptual artists navigating platforms whose fundamental logics privilege engagement over intellect, this proves insufficient. Artists require what can be termed meta-autonomy: control over whether and how platforms influence their intellectual direction at all, including capacity to resist platform logics entirely.

Consider the distinction: Standard autonomy asks "Can users control how algorithms surface content?" Meta-autonomy asks "Can users opt out of algorithmic curation while retaining platform benefits?" The former accepts platform mediation as inevitable; the latter questions whether mediation serves users' intellectual development. The framework should create opportunities that foreground choice about participation itself, allowing users to reflectively define when, how, and to what extent they engage with platform systems.

4.2.3. Recognizing Invisible Intellectual Labor

Competence, as the feeling of growth and mastery, appears across frameworks as motivational prerequisite. SDT argues competence satisfaction requires clear progress signals and positive capability feedback [15, p. 229]. ARCS's confidence dimension suggests systems should provide achievable challenges with visible skill development [42]. Fogg's ability variable treats competence as friction-reduction: making desired behaviors easier [40].

Conceptual ideas can work reversly about competence indicators. Conceptual dead-ends, abandoned frameworks and readings, failed experiments — they all appear identical produces no platform-visible yet constitute productive inquiry. Intellectual risk-taking may decrease measurable output while advancing thinking. How can artists experience competence growth when platforms provide only engagement metrics irrelevant to intellectual development?

Conceptual art involves open-ended inquiry where progress remains ambiguous and 'mastery' perpetually deferred. Platforms needs to leverage the advantages of digital accessibility to visualize visualising theoretical engagement and recognizing artists' unique competence, conceptual experimentation, and intellectual consolidation as legitimate practice activities deserving recognition. Integrated with competence, the appropriate signals and instant feedback can be grounded as embedded features.

4.2.4. Temporality: Fast Actions vs. Slow Thinking

Behavioral frameworks privilege action and immediacy. Fogg's [40] model emphasizes precise prompt timing — behavior occurs when motivation, ability, and trigger converge simultaneously. This assumes behaviors are discrete, completable actions occurring in moments. PSD similarly focuses on interaction design: how interface elements trigger specific responses [5]. Recognising conceptual work operates through incompatible temporalities, artists require reflective pauses to spark intellectual consolidation. They may go through weeks or months reading theory, investigating precedents with no output occurs. Frameworks assume continuous engagement is success. Intellectual work requires accommodating what can be termed productive invisibility in the periods where rigorous thinking happens but platforms see nothing.

Frameworks assume continuous, measurable engagement as design goal. Intellectual work requires platforms accommodating discontinuous participation, extended research phases, and cognitive rhythms resisting quantification. This will also demand reconceptualizing what 'successful platform use' means for conceptual artists.

Comparative analysis indicates that existing motivational frameworks, focusing on behavior change, autonomy, competence, and engagement, require significant revision for intellectual work contexts. Four key adaptations emerge.

(1) From behavior change to capacity preservation: frameworks must protect cognitive resources such as sustained attention, curiosity, and tolerance for ambiguity that platforms often erode.
(2) From choice provision to resistance legitimization: systems should respect users' selective disengagement from platform logics that hinder conceptual growth.
(3) From visible output to invisible labor: recognition must extend to theoretical reading, reflection, and conceptual experimentation beyond measurable activity.
(4) From continuous engagement to rhythmic participation: platforms should align with the nonlinear rhythms of intellectual work, valuing depth and productive invisibility.

These shifts, integrated with PSD's ethical principles of Outcomes, Autonomy, Transparency, and Motivation, inform subsequent design interventions: ethical persuasion for intellectual depth, loyalty systems for conceptual growth, reflective affordances, and discourse-oriented communities.

5. Case Studies: Ethical Design in Practice

To illustrate how ethical persuasion and user--centric design can be implemented, the case studies analysis is conducted through three digital platforms called Cara, Are.na, and i-D. Each plays a critical role in informing different facets of the ethical UX prototype:

- Cara is positioned as a benchmark for how infrastructural policies can align with user values to foster trust and creative wellbeing;
- Are.na is taken as a reference for its interaction model that prioritizes non-coercive autonomy, reflective engagement;
- and i-D platform is regarded as a precedent, demonstrating how editorial curation and slow reading can function as a form of ethical persuasion that reinforces community fairness and authenticity.

5.1. Infrastructural Value Alignment: Cara's Policy-Based Ethics

Cara is a new social platform (launched 2023) built explicitly 'for artists, by artists', and it has quickly become a testbed for ethical design principles in action (Fig. 4). Unlike mainstream art--sharing sites, Cara's defining stance is an ethical one: it staunchly opposes AI-generated art and the misuse of artists' work for AI training. In practice, this means Cara implements features and policies to protect user autonomy and intellectual labor, which is a sharp contrast to big platforms that often treat user content as a free resource. For instance, Cara automatically adds 'No AI' metadata tags to every image upload to discourage scraping by AI models. It outright bans AI-generated images in portfolios and forbids using any content on the site to train AI without consent. Another collaboration is working by an anti-AI filter called Glaze (Fig. 5), with its outstanding feature is to fool generative AI into thinking that source images have properties that are different from a person's eye view, making the digital artwork useless to the AI program. These principled decisions align the platform's values with its users' values: many artists are deeply anxious about algorithm performance and the tendency of mining their creations without permission.

Beyond AI issues, Cara's scheme design also mimics familiar social media functions (feeds, follows) but prioritises community and well-being. There are no inscrutable algorithms manipulating what artists see: users can customize their home feed (Fig. 6) and see posts chronologically or based on their chosen preferences. The services of monetization are aligned with users' needs (e.g. optional job boards and portfolio features) rather than exploiting attention through ads. The key lesson is that persuasion and loyalty can be achieved ethically: Cara persuades artists to join and share human-generated content, but by tangibly demonstrating it values their creative rights and long-term trust with autonomy. By building ethical policies against AI misuse as a benchmark, it supports users to share authentically in both mindset and work on Cara community, by alleviating the fear and friction they feel elsewhere.

5.2. De-Escalation: Are.na's Anti-Metric Architecture

Are.na takes a markedly different approach from mainstream social networks to ensure an anxiety-free reflective space. With no 'like' buttons (Fig. 7), no follower counts, no algorithmic feed, and no ads [48], it is often dubbed 'the social network antithesis' [50]. Founded in 2011 as a creative research and bookmarking tool, Are.na has steadily cultivated a niche but dedicated community of artists, designers, and thinkers. Its philosophy is prioritised to be a 'mindful space' for collaborative knowledge-building rather than an attention silo. Instead of vanity metrics, Are.na focuses on content and connections, such as

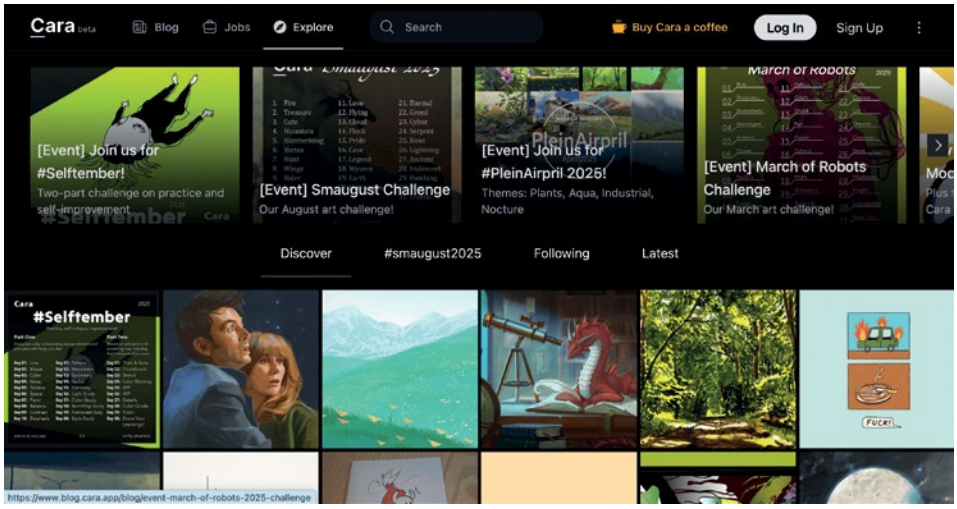


Fig. 4 Screenshot of Cara's Exploring Page Illustrating Social Feed. Source: [46].

Fig. 5 Explanation of Glaze AI-blocking tool. Source: [47].

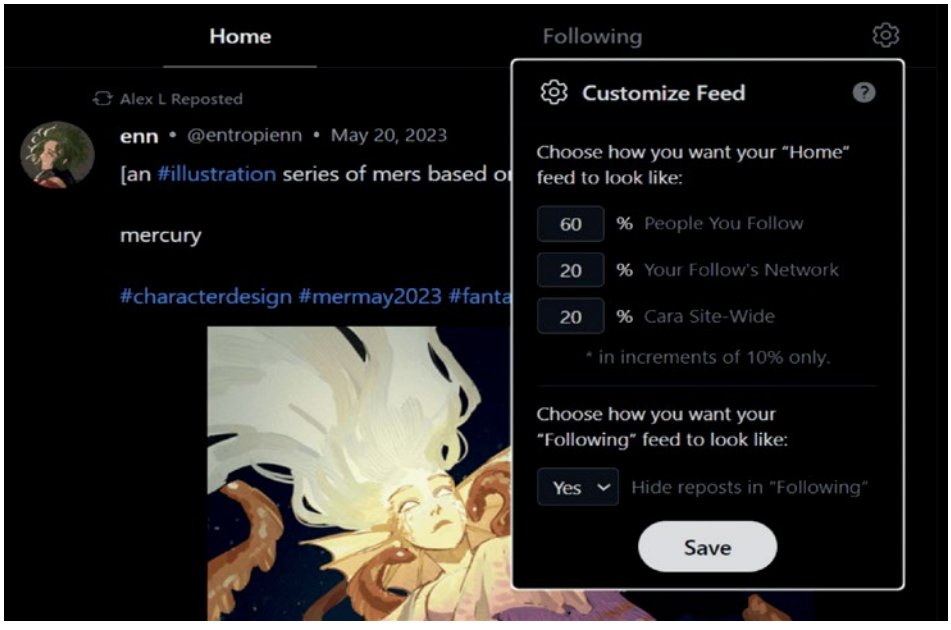


Fig. 6 Screenshot of Cara Feed. Source: [47].

users saved images, links, and ideas into thematic channels and collaborate freely.

The absence of recommendation feeds reduces anxieties like FOMO, virality, and social comparison [48]. Are.na subtly encourages participation through intrinsic rewards through raising satisfaction levels of curating ideas in a quiet, non-competitive space. As the team explains, the goal is to give users "more control over their digital footprints" and to promote exploration "on their own terms", fostering long-term curiosity over dopamine-fuelled engagement [48].

In practice, regarded as 'a tool for thinking together' that builds around shared inquiry [48], Are.na functions more like a collaborative studio or digital library opposed as social feed. Ethically, it exemplifies pro-social persuasive design: while enhancing thoughtful curation and collaboration in a respectful way, it diligently avoids addictive dynamics, using natural stopping points rather than endless scroll. The platform's user loyalty, though modest in scale, proves that quality-oriented, user-respecting design can sustain community over time.

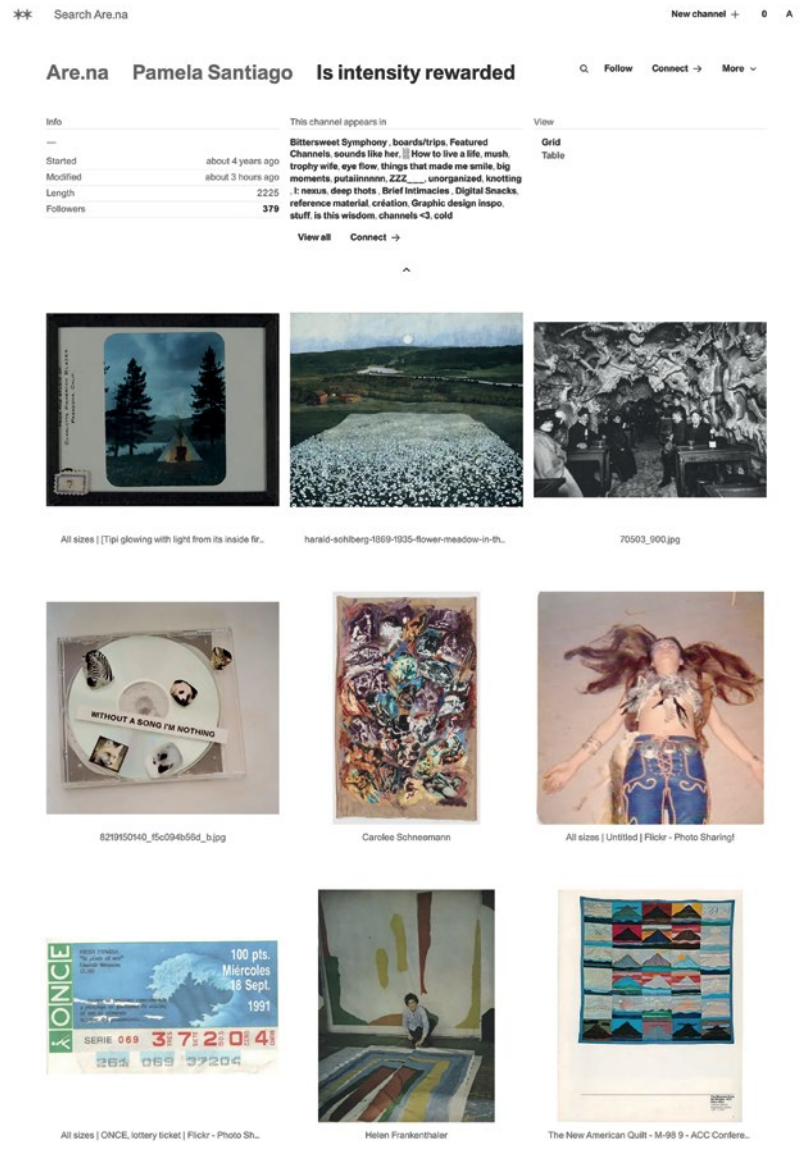


Fig. 7 Screenshot of Are.na Interface showing no algorithmic feed (2025). Source: [50].

5.3. Curatorial Legitimacy: i-D's Editorial Validation Model

i-D reveals a unique perspective as a media platform that has long championed emerging creative voices. i-D Magazine, founded in 1980, brands itself as 'a global platform for emerging talent, celebrating fashion, culture, individuality and youth', considered as a precedent for creator-focused spaces. While primarily a publication, recently revitalized in both print and digital formats after its acquisition by new ownership, its curatorial approach models ethical platform design through editorial integrity [51]. Over four decades, i-D's editorial ethic emphasizes authenticity, subcultures, and avant-garde expression, building a community through cultural credibility rather than algorithmic manipulation. For young creatives, being featured by i-D confers authentic validation: the quality recognition grounded in curatorial selection, not social media virality. For instance, inclusion in 'Ones to Watch' (Fig. 8) lists is perceived as a signal of originality and creative legitimacy. This model aligns with ethical persuasion: i-D inspires rather than manipulates, drawing audiences not with dopamine-triggering scroll mechanics but with human-curated stories that resonate with identity and aspiration.

Equally significant is its adoption of a slow-reading interface (Fig. 9), encouraging engagement with long-form, immersive

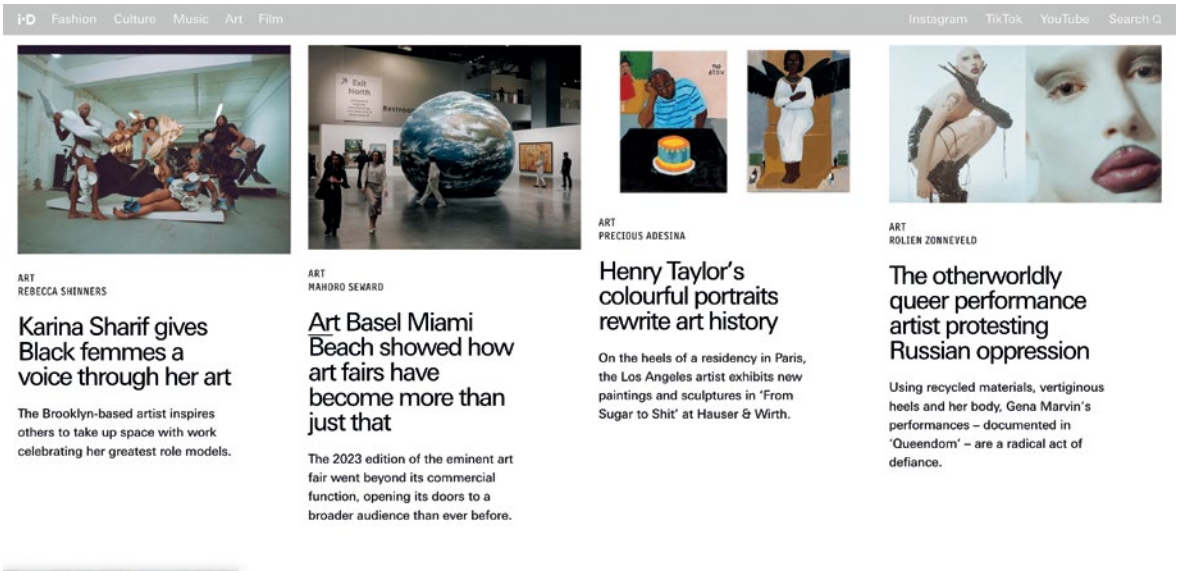


Fig. 8 Ones in Watch Series of Reading (2025). Source: [52].

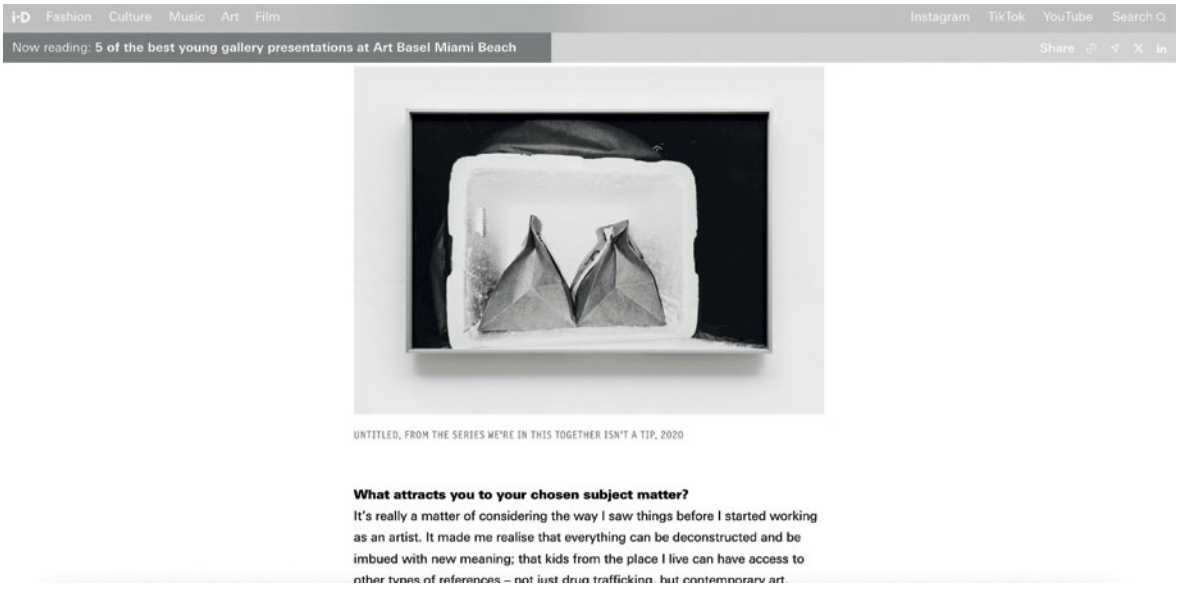


Fig. 9 Screenshot of Slow-reading Interface(2025). Source: [53].

editorial reels instead of algorithmically ranked, bite-sized content. This deliberate design fosters deep, sustained attention, inviting readers to linger with both visual and textual stories while resisting the distraction-driven patterns of mainstream platforms. The loyalty i-D has cultivated highlights the power of a platform that values talent, substance, and trust over virality [51].

Taken together, these platforms offer viable alternatives to the virality-first logic that dominates mainstream social networks under the applied ethics in design system. Insights from the visual research phase were translated into concrete visual guidelines that shape the framework's ethical orientation. These include the use of generous whitespace, neutral backgrounds, and clear typographic hierarchy to produce cognitive calm; the removal of likes, rankings, and follower counts in favor of narrative signals such as "added to collections" or "discussed in." The layout system is modular and narrative-driven, combining image-first and text-rich tiles with natural stopping points to counter infinite-scroll fatigue. Navigation prioritizes thematic and depth-first exploration over trend-based or algorithmic curation, supported by non-coercive interaction cues such as soft prompts and opt-in reveals. Collectively, these principles establish

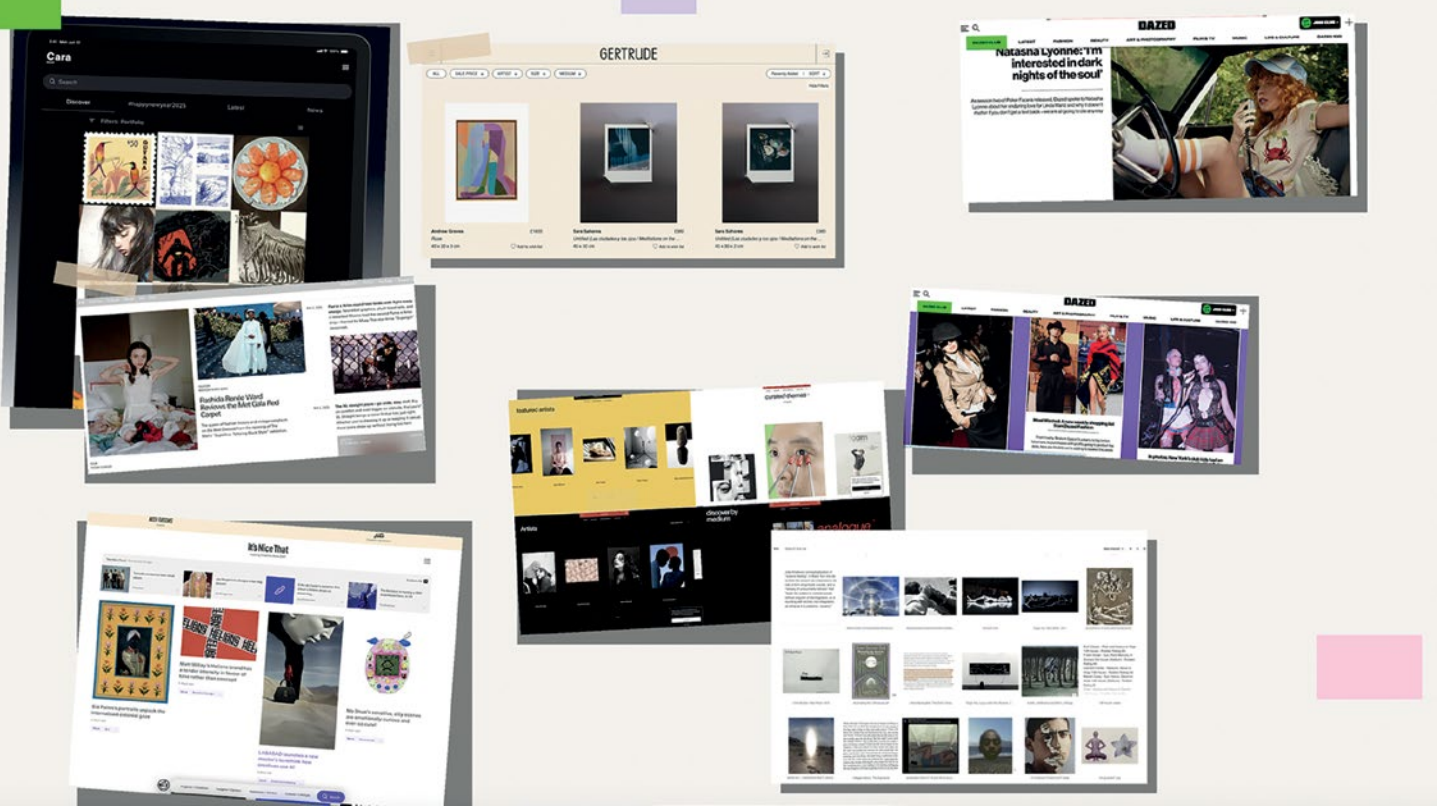


Fig. 10 Visual Moodboard. Source: [54].

a slow, intentional, and inclusive visual direction for the design framework.

6. Synthesizing an Ethical Framework

This section synthesizes these fragmented constructs and continued insights into a unified framework operationalizing ethical platform design for conceptual artists. The resulting Value-Reflection-Community (VRC) model constitutes theoretical innovation across dimensions: reconceptualizing platform ethics from harm reduction to capacity cultivation, integrating behavioral psychology with epistemology, and operationalizing abstract principles into concrete design interventions.

6.1. Theoretical Integration and Innovation

The conceptual framework VRC's architecture comprises three interdependent pillars responding directly to structural pathologies:

Pillar 1: Value-Aligned Showcase addresses concept devaluation by inverting platform presentation hierarchies. Where conventional systems privilege visual spectacle, VRC embeds concept-first presentation: portfolio architectures guiding artists to articulate theoretical frameworks, intellectual influences, and philosophical contexts before visual documentation. This operationalizes PSD's Outcomes proposition and SDT's autonomy principle through what can be termed epistemic scaffolding — interface prompts structured around intellectual inquiry („What theoretical problem does this address? What thinkers inform this work?") rather than engagement optimization. Discovery mechanisms curate via theoretical alignment that connects artists investigating similar conceptual frameworks rather than algorithmic popularity. The innovation lies in systematically prioritizing ideas over images within platform architecture, materializing the epistemological values conceptual practice requires.

Pillar 2: Critical Reflection addresses intellectual compromise by embedding temporal structures accommodating thinking's actual rhythms. Drawing on slow technology principles and reflective practice theory, this pillar introduces productive friction: a posting delay requiring theoretical contextualization, posting caps preventing content treadmill, de-emphasized engagement metrics replaced by conceptual development tracking. Private intellectual journals document theoretical reading, failed concepts, and evolving frameworks separate from public presentation.

The theoretical contribution lies in reconceptualizing 'successful platform use' from continuous visible activity to discontinuous intellectual consolidation — legitimizing where Section 4.2.4 termed productive invisibility.

Pillar 3: Upward Community Connections addresses validation collapse by architecting intellectual communities: bounded intellectual spaces organized around shared conceptual frameworks rather than aesthetic similarity or popularity metrics. Curated entry requires theoretical statements demonstrating conceptual seriousness; mentorship matching connects early-career artists with established thinkers based on shared intellectual terrain; collaborative tools facilitate reading groups, theory discussions, and rigorous critique rather than performative affirmation. This synthesizes communities of practice theory with SDT's relatedness needs and Are.na's metric elimination, creating what can be termed intellectual bonding capital, deep ties enabling vulnerable theoretical exchange impossible within broadcast-oriented platforms.

6.2. Interconnections

The framework's theoretical innovation lies not in discrete pillars but their mutually reinforcing relationships. Value-aligned presentation (Pillar 1) identifies artists' intellectual commitments, which inform reflection prompts (Pillar 2): "Since you value phenomenological inquiry, how does this work engage embodied experience?" Reflection reveals conceptual gaps and triggers community connections (Pillar 3) with scholars engaging similar frameworks. Community critique feeds reflective practice with external perspectives, deepening intellectual sophistication. Refined thinking enhances portfolio presentation, attracting theoretically aligned audiences, strengthening community discourse quality. This creates virtuous intellectual cycles: each pillar amplifies others' capacity to support sustained conceptual development.

Critically, VRC architecture embeds anti-extractive defaults: intrinsic motivation protection through metric de-emphasis, meta-autonomy through algorithmic opt-out mechanisms, invisible labor recognition through theoretical development tracking, temporal accommodation through posting caps and reflection requirements. These design decisions instantiate ethical principles identified in Section 4 — transparency, autonomy, value alignment — within technical infrastructure rather than leaving them as aspirational guidelines.

6.3. Theoretical Contributions

This research advances three contributions. First, it distinguishes conceptual artists' platform vulnerabilities from general creator populations, identifying how algorithmic logics privileging visual spectacle over theoretical complexity produce concept devaluation, intellectual compromise, and cognitive colonization. Second, it synthesizes persuasive systems design, self-determination theory, reflective practice, and communities of practice into the Value – Reflection – Community (VRC) model. This is a cornerstone of abstract ethical principles into concrete design interventions: epistemic scaffolding, productive friction mechanisms, intellectual communities, and metric de-emphasis. Third, it theoretize feasibility to inform practice--led research, producing future prototypes that prove non-extractive platforms can operationalize ethical commitments.

At its core, the framework integrates ethical persuasion, loyalty-based design, reflective practice, and community grounding into one coherent architecture. It directly addresses conceptual artists' needs while resisting the extractive defaults of platform capitalism. The following sections translate these principles into tangible design forms of interface affordances, algorithmic alternatives, and interaction patterns for a genuinely non-extractive online community.

7. Methodology

The research adopts a practice-led, design-based methodology grounded in ethical UX principles, persuasive system design (PSD), and critical design thinking. The structure of the research follows a four-phase integrated design process: 1) Theoretical framework mapping; 2) Contextual self-reflection insights of autoethnography; 3) Usability testing, and 4) Critical evaluation & framework consolidation. The primary specifics of Phase II-IV assess the theoretical ethics (autonomy, transparency, motivation, and value alignment) into practical design outputs.

7.1. Methodology Overview

Throughout the research, the methodology employed the 6 phases of design thinking in con-

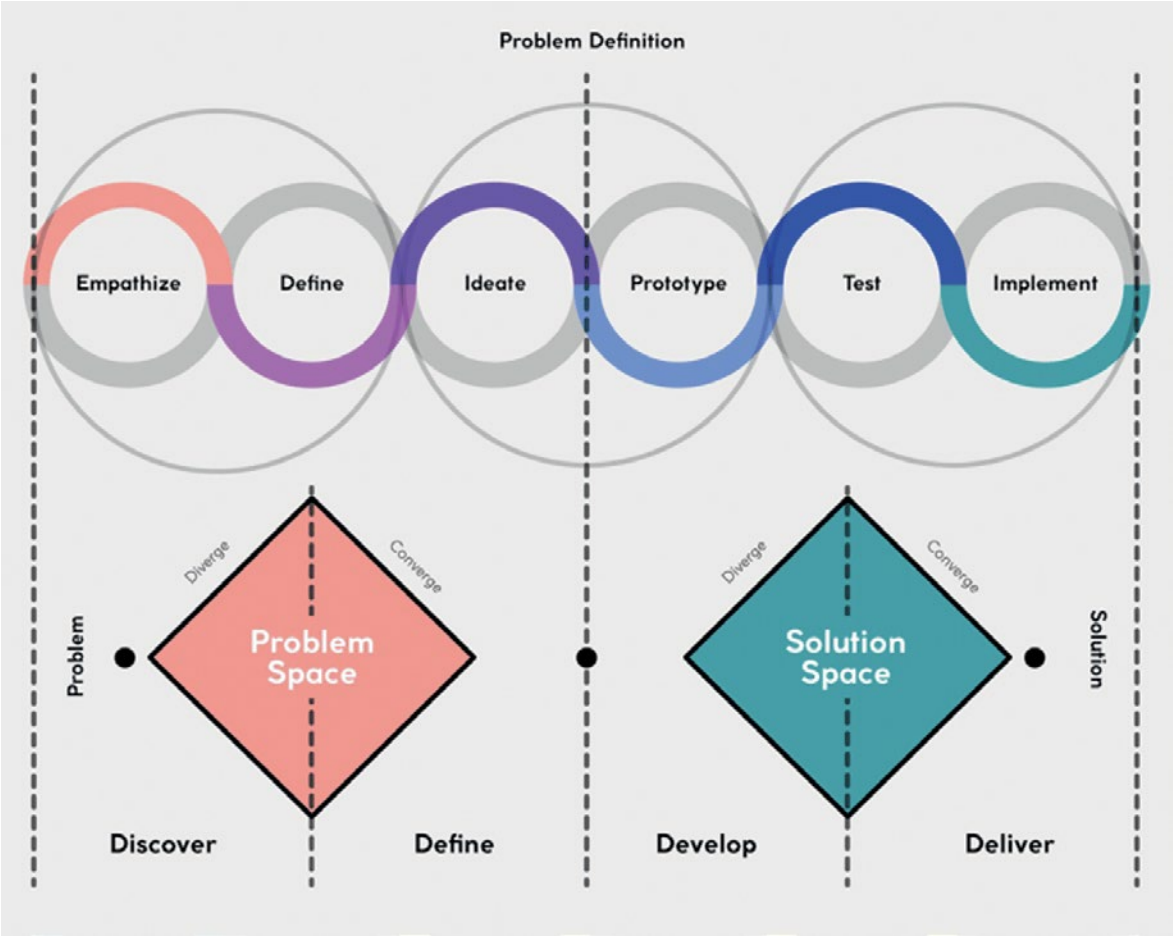


Fig. 11 Double Diamond and the 6 Phases of Design Thinking.
Source: [55].

junction with the Double Diamond strategy (Fig. 11), from empathising with the audience and market, defining the core problems, and gathering ideation insights through autoethnographic reflection; This was followed by iterative stages of prototyping, usability testing, and finally implementing the deliverables in the form of a UX persuasive framework. The research adheres rigorously to design integrity to facilitate iterative choices and cycles of problem identification. The findings are structured to serve as useful tools for UX/UI designers, platform developers, system architects, and other stakeholders interested in developing ethically sound, artist-centered digital experiences.

The following is the holistic research process flowchart, informed by the '6 Design Thinking Phases with Integrated Double Diamond' [54], to respond accordingly to timeline, phase division, and corresponding tasks to finish in each design phase. A detailed research framework is visualised in Fig. 12 and will be expounded in the following sections.

Phase I (Preliminary Reviews and Planning): this phase of secondary research maps theoretical analysis across platformisation case studies, digital self-branding, creative wellbeing, and ethical UX design persuasion frameworks as potential alternatives to current platform norms. Followed by the literature reviews, the following sequential phases will be implemented as described below.

Phase II (Self-Reflexive Practitioner Inquiry) aims to generate situated, embodied knowledge through a reflexive, design-led methodology. Conducted during an overseas research period, this phase brings together the researcher's critical ideation logs, co-created 10-day participant diaries, and comparative interviews with early-career artists in the UK and China. These activities foster both internal reflection and participant-driven insight, grounding the design process in

lived creative realities. The culmination of this inquiry will be a set of evidence-informed wireframes and key user flows for a minimum viable prototype (MVP), developed through continuous reflective journaling. The process supports an ethics-aligned, culturally responsive design practice that bridges personal experience with broader user needs.

Phase III (Qualitative Participant Research): integrates primary participant research through a structured usability testing of individual, facilitator-led usability sessions. Early-career artists will be selected and meet 1-on-1 with the researcher, who will guide them through a series of goal-oriented tasks on the MVP prototypes. While introducing each task, the researcher as the host observes neutrally, then conducts a brief post-task interview on ease, clarity, and ethical fit. Data collected include task-completion rates, time, error counts, observational notes, and satisfaction ratings. These evaluated metrics will be cross-checked against Phase II autoethnographic insights to surface mismatches or overlooked pain points, ensuring the prototype honours ethical persuasion propositions.

Phase IV (Analysis & Refinement): continues with iterative evaluation and refinement of the prototype. Insights are consolidated through documentation analysis tools along with the development of a holistic user journey map and system map based on usability testing. These methods support the synthesis of key findings and culminate in the articulation of final insights and the delivery of a framework-ready structural design.

Below is a more detailed outline of each phase to provide a clearer understanding of their key sectors and significance.

7.2. Preliminary Reviews and Planning | PHASE I

In this preliminary phase, the literature review brings together insights from platform studies, media theory, digital sociology, behavioral research, and applied ethics. It combines these with industry data and artists' testimonies to establish a strong foundation for the project. The first part explains how platformisation and algorithm-driven self-branding are reshaping early-career artists' practices and wellbeing. Next, the review examines how UX design, especially AI-accelerated persuasion, influences behavior and highlights specific pain points that artists experience on mainstream platforms. To propose grounded alternatives, the study also reviews market data and case studies of platforms such as Cara, Are.na, and i-D, which show different design strategies in practice. A key section systematically evaluates leading behavior-change models (PSD, Fogg, PET) to identify where they succeed or fail in protecting creative authenticity and community. From this mapping, the review develops four ethical propositions — outcome, transparency, autonomy, and motivation. The outcome of Phase I is a clear framework that highlights existing gaps, justifies an ethical-persuasion and loyalty-driven approach, and sets the criteria for the practice-led prototyping and evaluation in the next phases.

7.3. Self-reflexive Practitioner Inquiry Approach | PHASE II

Phase II centers on gathering situated knowledge through an autoethnographic reflective diary, documenting ideation and early concept development in the researcher's dual role as emerging artist and UX practitioner. From August to December 2025, a five-month fieldwork in China and UK, conducted with an Art Foundation, will provide a context-rich environment for reflection, observation, and practice as a UX associate. A reflective diary/log will capture ideation, critique, and design processes leading to a functional web-based MVP, with monthly submissions to the supervisor at ADM, NTU.

To operationalize this self-reflexive inquiry, Phase II is structured into four interrelated components: (1) Reflexive Design Journaling, (2) Comparative Cross-Cultural Interviews, (3) 10-Day Solicited Participant Diaries, and (4) Wireframe and MVP Development, together enabling multi-perspective reflection and triangulated data.

7.3.1. Reflexive Design Journaling

In this study, the researcher assumes a dual role: both as a UX designer prototyping a digital platform and as a reflexive researcher conducting ethnographically informed inquiry. To sustain this reflective stance, a structured Reflexive Design Journal will be maintained throughout the design process, with a minimum of two entries per week during active phases such as ideation, wireframing, and usability feedback loops.

Each entry will be dated, tagged (e.g., #trust, #issues, #platformisation), and structured to include five elements: Context (e.g., design decisions, meetings, or user feedback), Reflection (what was felt, noticed, or questioned), Tensions (ethi-

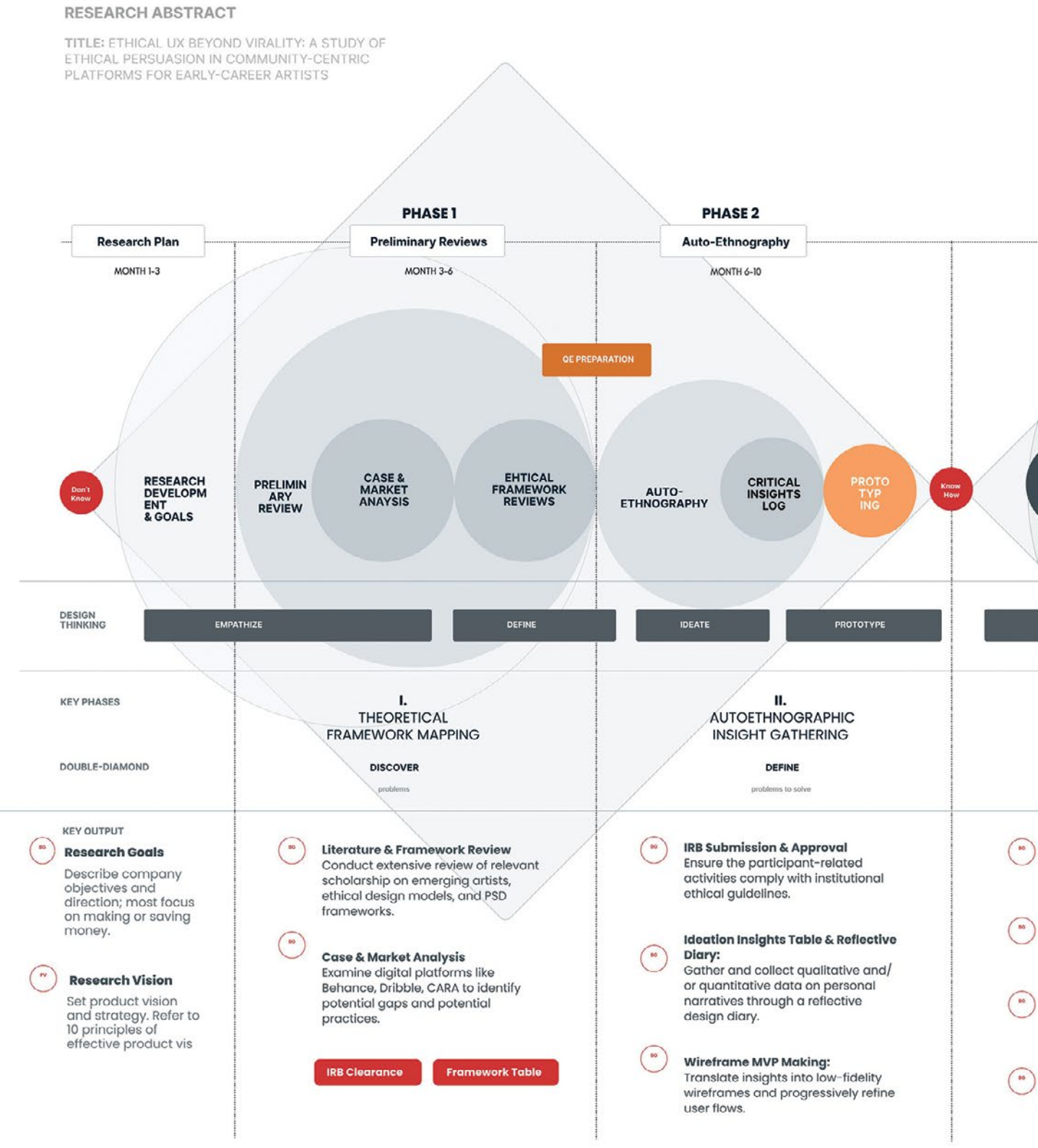
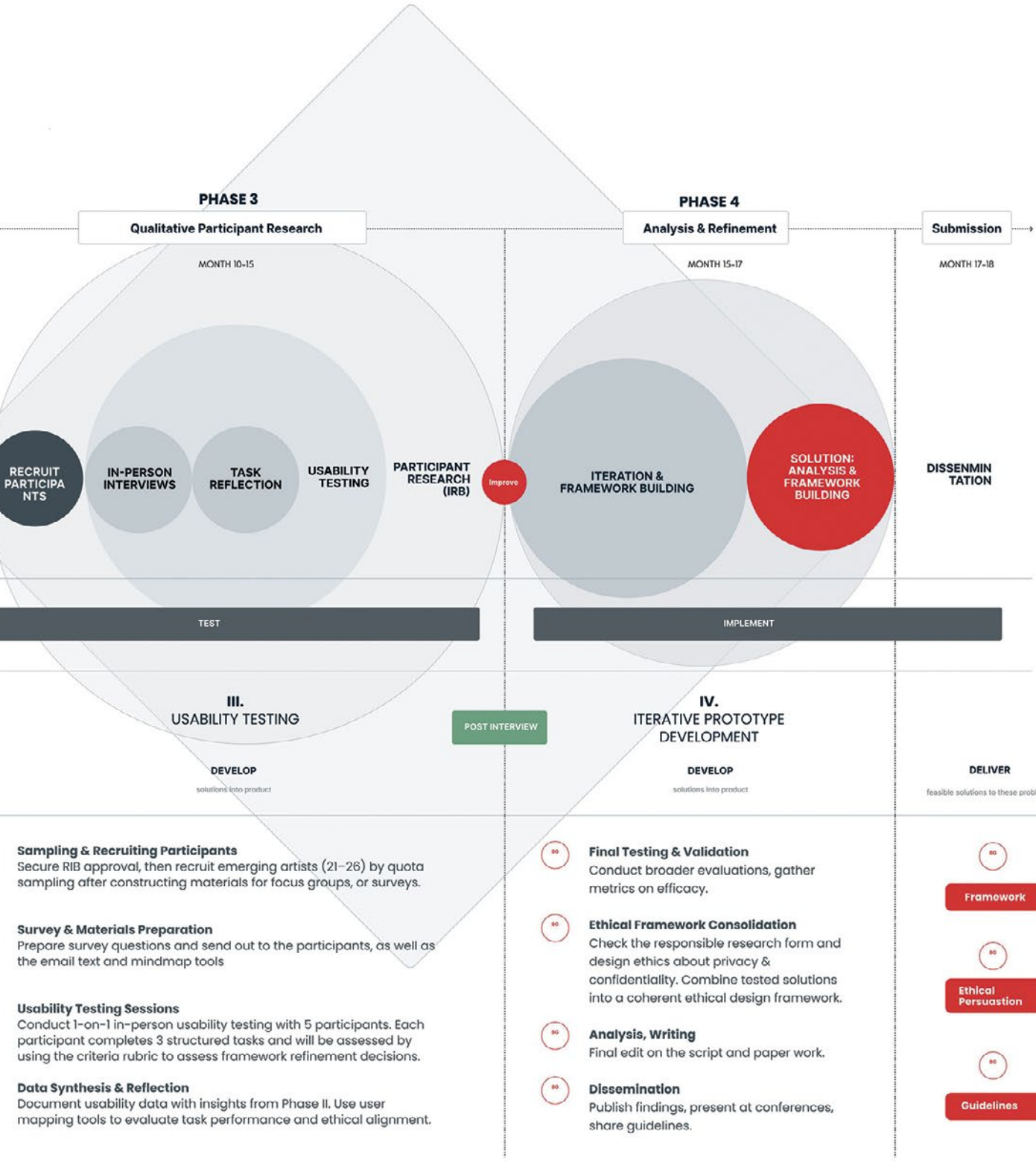


Fig. 12 Research Framework. Source: [56].



Sampling & Recruiting Participants
Secure RIB approval, then recruit emerging artists (21–26) by quota sampling after constructing materials for focus groups, or surveys.

Survey & Materials Preparation
Prepare survey questions and send out to the participants, as well as the email text and mindmap tools

Usability Testing Sessions
Conduct 1-on-1 in-person usability testing with 5 participants. Each participant completes 3 structured tasks and will be assessed by using the criteria rubric to assess framework refinement decisions.

Data Synthesis & Reflection
Document usability data with insights from Phase II. Use user mapping tools to evaluate task performance and ethical alignment.

Final Testing & Validation
Conduct broader evaluations, gather metrics on efficacy.

Ethical Framework Consolidation
Check the responsible research form and design ethics about privacy & confidentiality. Combine tested solutions into a coherent ethical design framework.

Analysis, Writing
Final edit on the script and paper work.

Dissemination
Publish findings, present at conferences, share guidelines.

Framework

Ethical Persuastion

Guidelines

cal, aesthetic, or institutional conflicts), Implications (adjustments or new ideas arising), and an Alignment Check (how the activity relates to the four ethical principles of persuasion). Special attention will be given to three analytical contexts: (1) how personal values and ethical priorities are challenged or reinforced in design, (2) how institutional forces in the UK and China, such as time, hierarchy, or resource constraints, shape UX decisions, and (3) how embedded observation during collaboration and journey mapping reveals gaps between theoretical frameworks and applied practice. The journal will allow for diverse forms of input, including sketches, annotated screenshots, and quotations from internal discussions. Its key functions are to act as a situated trace of how theory meets design in practice, guide transitions from low-fidelity to higher-fidelity prototyping by identifying cultural differences, usability uncertainties, and ethical dilemmas, and support comparative analysis by showing how design decisions evolve through lived and reflective experience. The journal contributes to the foundation of persuasive UX user flows and key design decisions, ensuring that the final MVP embodies both rigorous reflection and practical application.

7.3.2. Comparative Cross-Cultural Interviews

The key component of Phase II is a comparative cross-cultural study that anchors a set of interviews with 2-4 early-career craft artists based in two different cultural contexts (the UK and China). The motivation for this component is to broaden the perspective of the inquiry and examine how cultural and institutional contexts shape the interplay between artistic trajectories and digital platforms. Many issues identified in diaries (e.g., self-promotion discomfort or seeking validation online) may manifest differently across cultures due to varying social norms, market structures, and support systems for artists. Thus, by conducting in-depth interviews in two distinct settings, the research can contextualize and contrast the findings, enhancing the robustness of the conclusions.

7.3.3. Semi-strucutred Question Glossary List

Each interview will be semi-structured, following a flexible guide of themes rather than a rigid questionnaire. This approach ensures consistency in covering key topics while allowing each conversation to flow naturally and surface the interviewee's unique experiences. The interview guide is informed by earlier phases (surveys and diaries) and is organized around several core themes central to the research questions. These include in the glossary of questions will evolve and expand from any informative findings during Phase II:

Platform Use & Posting Habits: How artists engage with platforms-frequency, type of content shared, strategies for visibility, and attitudes toward posting.

Emotional Comfort & Exposure: Their comfort with being visible online; feelings of vulnerability when sharing; how they deal with critique, silence, or rejection.

Career Pathways & Livelihood: How artists pursue careers, and how online presence supports or hinders income, opportunities, and professional identity.

Validation Sources: Differences between online validation (likes, comments, follows) and offline validation (gallery shows, critique, community recognition).

Cultural Views on Self-Promotion: How cultural norms shape self-promotion-whether seen as entrepreneurial or as arrogance, and how artists navigate this.

Visibility vs. Vulnerability: Trade-offs between visibility (opportunity, recognition) and risks (judgment, copying, trolling), and strategies artists use to cope.

Post-Graduation Transition & Support: How recent graduates navigate the shift into professional life, including institutional support gaps and the role of digital platforms in filling them.

7.4. Wireframe prototyping and MVP Development

Following above findings, I will begin translating insights into low-fidelity wireframes and progressively refine them toward a minimum viable prototype (MVP). This will be critically informed from the Reflexive Design Journal, Comparative Interviews & Solicited Diaries. This design process will prioritise several components, while staying iterative across different stage. Firstly, it will develop the key user flows that reflect artist values surfaced in the creative institution (e.g., non-algorithmic discovery of artists, user-based process sharing, opt-in autonomy). Secondly, it maps out the modular, ethical interaction components, such as feedback without performative pressure, visible privacy controls, and creative

milestones. Lastly, scenarios that capture emotional decision points will also be demonstrated, such as 'publish vs save in private studio', or 'opt in to shared curation'. Each design choice will be annotated with its ethical rationale, supported by field insights and reflections from both my lived practice and theoretical findings.

7.5. Qualitative Participant Research | PHASE III

7.5.1. Participant Sampling

This study will adopt Winstanley (2023)'s Purposive Homogeneous Sampling (PHS) method to recruit participants who share key characteristics relevant to the research objectives. All selected individuals will be emerging conceptual creatives with direct experience in artistic practices both as users or both with a comparable range of age (typically 21-26 years), in alignments of this study on digital platform interaction on the part of conceptual artists. PHS is used in this context to support the particular purpose of the study: to examine shared challenges and perspectives among participants who are at a comparable career stage and operate within similar creative and digital environments.

7.5.2. Sample Size and Selection Criteria

While PHS will be applied, selection criteria are:

- N = 5 participants for usability testing,
- Full/part-time, studio-based conceptual artists in art, design, interaction design, or digital media,
- Actively use digital platforms (e.g., Instagram, Behance) to share/distribute work,
- Aged 21-26, representing early-career creatives in their first decade of professional practices,
- Basic-intermediate knowledge of UX/interface design (via coursework, projects, or platform use).

Gender, age (within range), and race are not exclusion criteria; diversity is encouraged. Geographic origin is open, as the study focuses on shared user experience. A sample of 5 ensures depth, feasibility, and rich data for focus groups and usability testing.

7.5.3. Usability Testing

To properly scale the research method, a round of focused usability testing is leveraged alongside the auto-ethnographic reflections. Referred to guidelines in the Interaction Design Foundation site, there are 5 structured steps to facilitate the implementation of the whole testing process.

Define

The usability testing aims to determine whether the prototype fundamentally helps early-career artists feel supported and authentically expressive within a peer community. The goals of successful testing are: (1) gauge the perceived impact of key features on creative wellbeing and narrative depth, (2) identify persisting pain points the design must conquer, (3) decide if the current work-in-progress is mature enough to advance to framework refinement, and (4) surface any major adjustments or missing elements required for the next iteration. All findings will be interpreted through the viewpoint of the ethical-persuasion propositions and user loyalty.

Decision

In-person sessions will be conducted, each lasting ~45 minutes. The scope for the testing is to test usability with ethical persuasion perspective on post feed, feedback & discussion, social connection building within artist-centric community.

Tasks

During the testing, the researcher will act as the host and facilitator. While observing, participants complete task scenarios and give feedback that mirror their experiential workflows but also emotional status, testing the platform's persuasive ethics in 3 prototype sections of a) Portfolio Album Sharing & Collection, b) Discussion Topic Board, and c) Social Feed + Connection Board List with 3 scenario-based tasks accordingly:

1. Authentic Post Sharing: To upload a new work-in-progress, decide whether to publish it publicly or save it to a private collection, and describe the reasoning.
2. Slow-Paced, Quality Community: To read a peer's post in full and leave a considered comment that advances the discussion.
3. Network You Choose: To customize the feed by selecting preferred themes, then follow at least two artists whose work resonates.

Recruit

A screening survey was developed to assemble a diverse sample of emerging artists for the usability study. The instrument contained 18 items structured into four domains: (1) demographic

and identity information, (2) artistic practice and mediums, (3) platform use patterns and challenges, and (4) attitudes toward algorithmic visibility, authenticity, and platform trust. Participants identified their creative disciplines (e.g., conceptual art, illustration, photography), typical mediums, and the digital platforms they use to showcase or manage their work.

To assess creators' relationships with platform dynamics, the survey included Likert-scale items measuring pressure to optimize content algorithmically, the influence of engagement metrics on creative decisions, perceived emotional support, and trust in visibility mechanisms. Participants also ranked common challenges (e.g., gaining visibility, receiving fair feedback, maintaining motivation, avoiding burnout). The instrument concluded with open-ended questions that invited participants to describe frustrations, define what constitutes a "trustworthy" and "artist-friendly" platform, and suggest features to add or remove. Collectively, these responses informed the sampling criteria and provided early qualitative signals about the ethical and experiential concerns shaping artists' platform practices. Five emerging conceptual artists will be recruited based on the selection criteria, with invitation email attached with participant consent form.

Facilitate/Moderate

Testing occurs in a relaxed studio space with the prototype on a laptop and sketch materials nearby. After reconfirming verbal consent, participants are encouraged to think aloud while tasks are timed and screen-recorded. Post-task mini-interviews capture perceptions of ease, clarity, ethical fit, and emotion. As shown in Table 1, their reactions will be specifically scored with the six-dimension rubric covering 5 assessing dimensions that mapped to the four ethical propo-

Tab. 4 Prototype-Perceived Success Rubric for Emerging Artists.

Dimensions	Key Question	1 – 2 (poor)	3 (good)	4 – 5 (Strong)	Proposition Tags
A. Safe Community Zone	Does the interface create a psychologically safe space for trial-and-error?	Few/no guard-rails for failure; immediate public exposure; no opt-outs	Some privacy controls; basic content warnings; limited cooldowns	Granular visibility (draft / peer-only / public); optional cooldown before comments; clear norms of respectful critique	P2 Outcome P4 Autonomy P6 Motivation
B. Ethical Friction	Does the system slow users enough to encourage reflection?	Infinite scroll, real-time counts, rapid reaction prompts	Scroll has natural stops; light prompts to pause	Chunked feeds, article-length scroll reels; no vanity metrics	P2 Outcome P5Transparency P6 Motivation
C. Quality Feedback	Does feedback move beyond like-counts to informed dialogue?	Only likes or emoji; no context	Comments allowed but shallow; limited prompts	Structured critique templates, taggable feedback types, private peer notes	P2 Outcome P4 Autonomy P5Transparency P6 Motivation
D. Upward Social Ties	Does the platform foster mentorship & meaningful connections?	Random follow lists; no discovery of peers/ mentors	Basic search & follow; occasional suggested users	Curated 'connect' suggestions by theme/ skill; mentor request feature; collaborative boards	P2 Outcome P4 Autonomy P6 Motivation
E. Authentic, Value-Aligned Expression	Does the UX/UI allow depth over virality?	Character limits; emphasis on trending tags	Medium detail fields; optional captions	Rich process reflection, long-form posts, multi- narratives; trending	P2 Outcome P4 Autonomy P5Transparency P6 Motivation
F. Sustainability & Usability of Practice	Does use feel helpful, usable, and engaging rather than exhausting?	Feel pressured to post; visible streaks; Unethical perception	Neutral workload; occasional prompts	Flexibility, wellbeing contents or reminders, zero-growth anxiety cues	P2 Outcome P4 Autonomy P5Transparency P6 Motivation

(Each dimension scored 1 – 5, where 1 = poor / 5 = excellent). Source: own work.

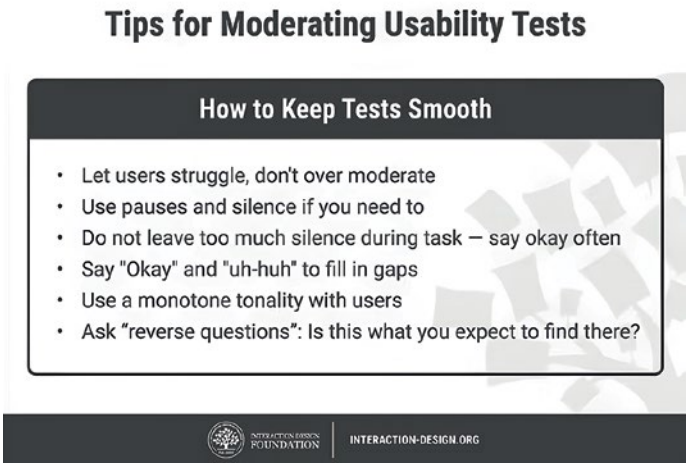


Fig. 13 Usability Test Tips (2025). Source: [57].

sitions shown in Table 2. Concurrently, quantitative metrics (completion, retention rates, errors, time) and qualitative notes (fulfillment, attitude, confusion points) will also be taken down to be triangulated against Phase II self-reflexive practitioner inquiry approach.

Throughout the participant research, the researcher will adhere to testing guidelines and tips (Fig. 13) to ensure research integrity and elicit authentic feedback.

7.6. Analysis & Refinement | PHASE IV

Following the usability testing and autoethnographic inquiry, the research moves to the last but the most crucial stage of synthesis and design refinement. The goal of Phase IV is to critically evaluate and prioritise the diverse ethical insights gathered from usability testing and translate them into actionable directions for ethical UX design. To support this, a suite of mapping tools will be applied, both serving an analytical function to provide qualitative feedback and decision-informing iterations.

7.6.1. User Journey Map

To capture the comprehensiveness and emerging patterns of user experience, the synthesis of the usability test data collection will employ a User Journey Map. This is defined as a well-established tool that intuitively illustrates a user's emotional status, goals, and actions across key interaction milestones. This method is foundational in service design and UX research [58] and is especially useful in research focused on systematic experiences, where affective states such as anxiety of algorithmic pressure or creative wellbeing can influence interaction. The journey map of making a mapping wall (Fig. 14) or digital map (Fig. 15) all helps to visualise 'critical moments' when trust, motivation, or loyalty is either enabled or compromised, providing the basis for the project focused on ethical persuasion.

Specifically, the mapping will also be used to detect and assess the evidence of: (1) artists can authentically express their work and personal narratives; (2) successful trust-building and re-

Fig. 14 An Example of Sketching Out User Journey (2025). Source: [59].

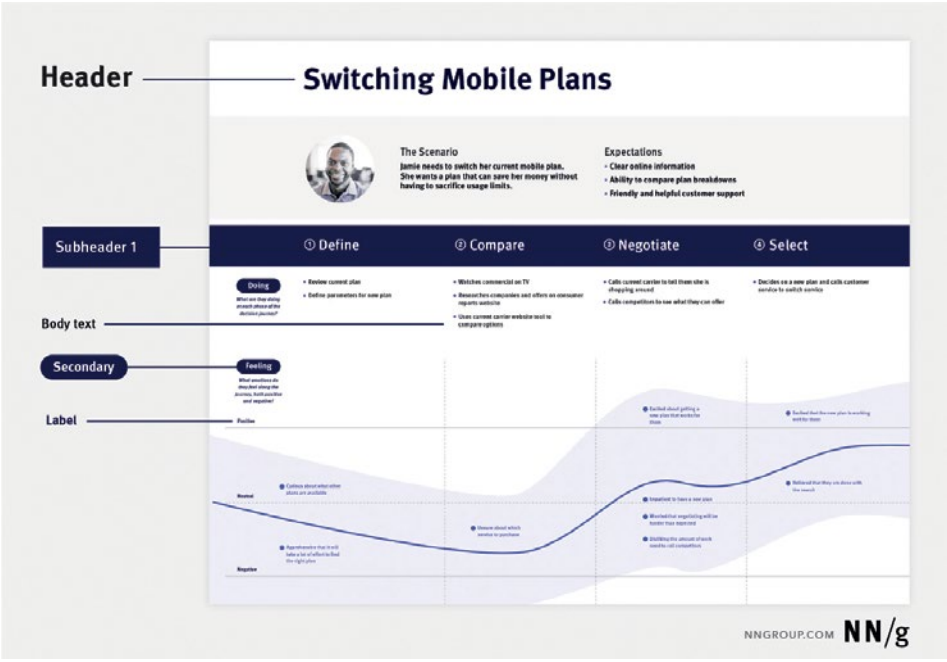


Fig. 15 A Digital Example Applied to a Journey Map. Source: [60].

duction of manipulative or performative pressures; (3) emergence of reflective, community-oriented interactions rooted in artistic integrity; and (4) meaningful protection of intellectual and emotional labor at key decision points.

7.6.2. System Map

To account for the broader cultural and interdisciplinary environment, a System Map is created to visualise the interconnected actors, services, and community-based stakeholders that shape platform use. System mapping, derived from systems thinking and strategic design [61, 62], helps researchers and designers understand the multi-layered factors influencing user experience beyond the interface. The sample system map (Fig. 16) demonstrates how these relational dynamics can be meaningfully visualized to guide strategic and ethical decision-making by illustrating key connections between relational terms. For early-career artists as the audience, the system map mainly responds to 'How might we' questions to ensure that the final synthesis stage is empathetically

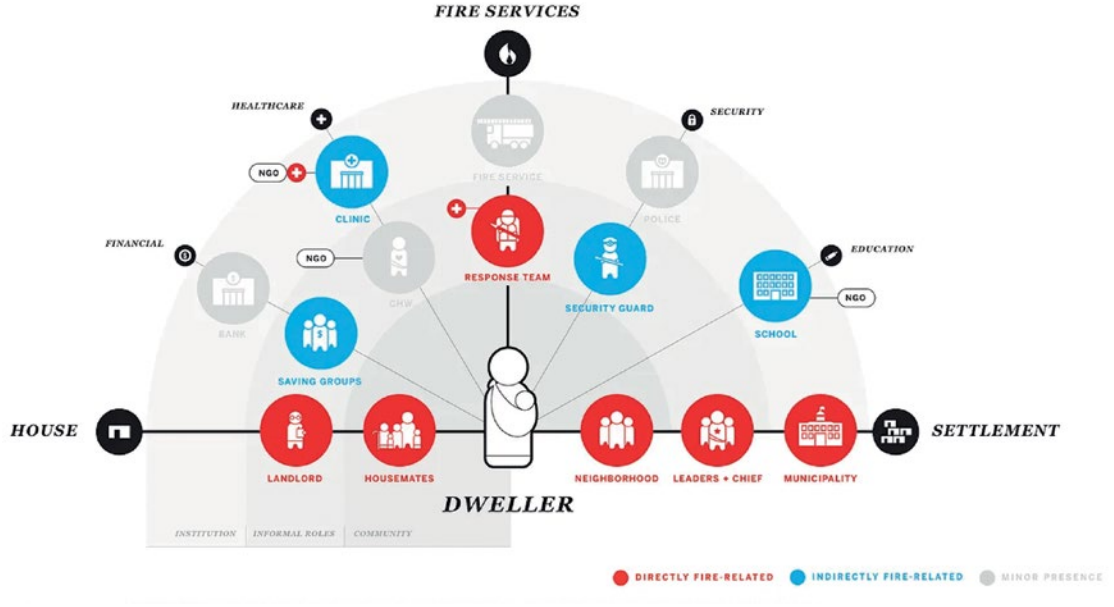


Fig. 16 An Example of Ecosystem map that draws the relations of different stakeholders. Source: [63].

and ethically grounded in prototypes with expected fidelity.

Final indexing will also be leveraged to organize the key insights and facilitate the final iteration of the ethical framework prototype itself. Together, the experience-oriented investigation grounded in recurring patterns and identified evidence can be consolidated.

8. Project Synopsis

This research project presents a practice-led inquiry into the development of an ethical user experience (UX) framework for digital platforms tailored to emerging conceptual artists navigating the tensions of algorithmic visibility, platformization, and digital self-branding. Rooted in critical UX scholarship and persuasive systems design (PSD), the study proposes a shift away from extractive design models that prioritize engagement metrics, toward systems that foreground narrative depth, creative autonomy, and long-term relational loyalty.

The central outcome is a series of functional wireframe prototypes, designed to embody a new form of 'ethical-persuasion and loyalty-driven UX'. These prototypes reject engagement optimization's extractive logics, instead embedding temporal structures accommodating slow thinking, validation systems recognizing invisible intellectual labor, and community architectures cultivating bonding capital through bounded intellectual spaces. The research demonstrates that ethical platforms supporting rather than exploiting conceptual practice are technically feasible — requiring not technological innovation but fundamental value reorientation from capacity extraction to capacity cultivation. By bridging critical platform analysis with constructive design intervention, this study contributes actionable frameworks for designers, institutions, and alternative platform developers committed to sustaining intellectual work's flourishing in the digital age.

Logistical & Operational Details

Equipment and Facilities: The study will use standard equipment and facilities, including a personal laptop, office computer, design softwares and online collaboration platforms. The research will use Microsoft Forms for surveys, Miro & Figma for documentation and idea mapping Otter.ai for audio recording, Figma for prototyping development. Usability testing will be conducted in-person while booking a studio space.

Budget Estimates: The projected budget is minimal. Key expenses include overseas research expenses, studio booking, printing materials, stationary supplies, and software subscriptions (Miro, Figma Pro, etc.). Total estimated cost: S$1200-1500.

Copyright & Clearance: The research is based on original materials and voluntary participant contributions, all of which will be documented with consent. There are no anticipated access issues, as recruitment will occur through existing online artist communities and networks in which the researcher is actively embedded.

Access Considerations: All participants will be emerging conceptual artists aged 21-26, recruited through purposive and quota-informed sampling. Access to participants will be facilitated via university networks, creative community outreach, and snowball sampling when appropriate. Due to the sensitive nature of emotional and creative identity, additional care will be taken to ensure inclusive language, flexible scheduling, and participant autonomy.

Personnel: The project is led by Principal Investigator Associate Professor Lisa Winstanley and Student Principal Investigator Xiao Leyang who is an ADM postgraduate student at NTU with interdisciplinary experience in UX, visual culture, and platform critique. No additional personnel are involved; however, input will be gathered from artists and design peers during participatory phases.

Ethical considerations: The study promises to prioritise user data & confidentiality, user agency, emotional boundaries, and creative autonomy at all stages. By waiting to engage participants until after formal IRB approval, the research demonstrates its commitment to responsible data collection and respectful human-centered inquiry.

CONCLUSION

This research demonstrates both the urgent necessity and technical feasibility of reimagining platform design through ethical frameworks specifically calibrated for conceptual artists naviga-

ting platformized creative labor. In response to extractive digital systems privileging virality over intellectual depth, this study developed an ethical persuasion and loyalty-driven UX framework challenging prevailing design norms through actionable alternatives grounded in outcome alignment, transparency, autonomy, and motivation.

Through practice-led methodology integrating theoretical synthesis, self-reflexive inquiry, participatory design workshops, and iterative prototyping, the research documented how current platform architectures produce concept devaluation, intellectual compromise, and cognitive colonization among early-career practitioners. The resulting Value-Reflection-Community (VRC) framework operationalizes four ethical propositions — outcomes, autonomy, transparency, motivation — into concrete design interventions: concept-first presentation scaffolding, productive friction mechanisms enabling reflective consolidation, theory-based micro-communities fostering rigorous discourse, and metric de-emphasis protecting intrinsic motivation.

The mid-fidelity prototypes function not merely as design proposals but as provocations demonstrating that non-extractive platforms can materially instantiate ethical commitments while meeting users' intellectual development needs. These interventions do not reject digital persuasion itself but reclaim it as methodology for strengthening conceptual identity, cultivating intellectual community, and sustaining artistic wellbeing against platform capitalism's corrosive effects.

Ultimately, this research establishes that ethical UX constitutes not compromise but necessity — the generative foundation enabling digital platforms to support rather than exploit intellectual work. By reorienting design values away from engagement extraction toward capacity cultivation, the framework offers implementable specifications for systems honoring creators' lived realities, amplifying authentic expression, and fostering long-term flourishing of conceptual practice in the digital age. The question is no longer whether ethical alternatives are possible, but whether designers, institutions, and platform developers possess the commitment to build them. ■

Xiao Leyang
Lisa Winstanley

References

1. Bucher, T. (2018). If...then: Algorithmic power and politics. Oxford University Press. https://doi.org/10.1093/oso/9780190493028.001.0001
2. Shneiderman, B. (2020). Human-centered artificial intelligence: Reliable, safe & trustworthy. International Journal of Human-Computer Interaction, 36(6), pp. 495-504. https://doi.org/10.1080/10447318.2020.1741118
3. Gray, C. M., Kou, Y., Battles, B., Hoggatt, J., & Toombs, A. L. (2018). The dark (patterns) side of UX design. In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (Paper 534). ACM. https://doi.org/10.1145/3173574.3174108
4. Fogg, B. J. (2003). Persuasive technology: Using computers to change what we think and do. Morgan Kaufmann.
5. Oinas-Kukkonen, H., & Harjumaa, M. (2009). Persuasive systems design: Key issues, process model, and system features. Communications of the Association for Information Systems, 24(1), Article 28. https://doi.org/10.17705/1CAIS.02428
6. HFI. (2010). PET design: Persuasion, emotion, and trust in user interfaces. Human Factors International.
7. Poell, T., Nieborgs, D., & Duffy, A. (2021). Platformisation. Polity Press.
8. Borum, R. (2010). The nature of trust. In R. Borum (Ed.), The psychology of threat assessment, pp. 15-28. Oxford University Press.
9. Garrett, J. J. (2011). The elements of user experience: User-centered design for the web and beyond (2nd ed.). New Riders.
10. Bishop, C. (2012). Artificial hells: Participatory art and the politics of spectatorship. Verso.
11. Gillespie, T. (2014). The relevance of algorithms. In T. Gillespie, P. J. Boczkowski, & K. A. Foot (Eds.), Media technologies: Essays on communication, materiality, and society, pp. 167-194, MIT Press. https://doi.org/10.7551/mitpress/9780262525374.003.0009
12. Newport, C. (2016). Deep work: Rules for focused success in a distracted world. Grand Central Publishing.
13. Cotter, K. (2022). Practical knowledge of algorithms: The case of BreadTube. New Media & Society, 24(6), pp. 1309-1328. https://doi.org/10.1177/14614448211008364
14. Oakley, K., & O'Brien, D. (2015). Learning to labour unequally: Understanding the relationship between cultural production, cultural consumption and inequality. Social Identities, 22(5), pp. 471-486. https://doi.org/10.1080/13504630.2015.1128790
15. Deci, E. L., & Ryan, R. M. (2000). The „what" and „why" of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry, 11(4), pp. 227-268. https://doi.org/10.1207/S15327965PLI1104_01
16. Schön, D. A. (1983). The reflective practitioner: How professionals think in action. Basic Books.
17. Lave, J., & Wenger, E. (1991). Situated learning: Legitimate peripheral participation. Cambridge University Press. https://doi.org/10.1017/CBO9780511815355
18. Arriagada, A., & Ibáñez, F. (2020). „You need at least one picture daily, if not, you're dead": Content creators and platform evolution in the social media ecology. Social Media + Society, 6(3), pp. 1-12. https://doi.org/10.1177/2056305120944624

19. Nieborg, D. B., & Poell, T. (2018). The platformization of cultural production: Theorizing the contingent cultural commodity. New Media & Society, 20(11), pp. 4275-4292. https://doi.org/10.1177/1461444818769694
20. Bishop, S. (2021). Influencer management tools, algorithmic cultures and the platformization of influence. Social Media + Society, 7(1), pp. 1-11. https://doi.org/10.1177/2056305121997735
21. Steyerl, H. (2013). The wretched of the screen. Sternberg Press.
22. Osborne, P. (2002). Conceptual art and/as philosophy. In M. Newman & J. Bird (Eds.), Rewriting conceptual art, pp. 47-65, Reaktion Books.
23. Marwick, A. E., & boyd, d. (2011). I tweet honestly, I tweet passionately: Twitter users, context collapse, and the imagined audience. New Media & Society, 13(1), pp. 114-133. https://doi.org/10.1177/1461444810365313
24. Duffy, B. E. (2017). (Not) getting paid to do what you love: Gender, social media, and aspirational work. Yale University Press.
25. Chou, H. T. G., & Edge, N. (2012). „They are happier and having better lives than I am": The impact of using Facebook on perceptions of others' lives. Cyberpsychology, Behavior, and Social Networking, 15(2), pp. 117-121. https://doi.org/10.1089/cyber.2011.0324
26. Duffy, B. E., & Wissinger, E. (2017). Mythologies of creative work in the social media age: Fun, free, and „just being me." International Journal of Communication, 11, pp. 4652-4671.
27. LeWitt, S. (1967). Paragraphs on conceptual art. Artforum, 5(10), pp. 79-83.
28. Alberro, A., & Stimson, B. (Eds.). (1999). Conceptual art: A critical anthology. MIT Press.
29. Becker, H. S. (1978). Arts and crafts. American Journal of Sociology, 83(4), pp. 862-889. https://doi.org/10.1086/226672
30. Bridgstock, R. (2013). Not a dirty word: Arts entrepreneurship and higher education. Arts and Humanities in Higher Education, 12(2-3), pp. 122-137. https://doi.org/10.1177/1474022212465725
31. Lena, J. C., & Lindemann, D. J. (2014). Who is an artist? New data for an old question.
32. Menger, P.-M. (1999). Artistic labor markets and careers. Annual Review of Sociology, 25, pp. 541-574. https://doi.org/10.1146/annurev.soc.25.1.541
33. Cutler, D. (2023). Anxiety nation: The cultural ecology of creative sector mental health. Changing Arts and Minds. https://www.changingminds.org.uk
34. Aristotle. (2009). The Nicomachean ethics (D. Ross, Trans.). Oxford University Press. (Original work published ca. 350 BCE)
35. Kant, I. (1998). Groundwork of the metaphysics of morals (M. Gregor, Trans.). Cambridge University Press. (Original work published 1785)
36. Buwert, P. (2016). Ethical design: A foundation for visual communication [Doctoral dissertation, Edinburgh College of Art, University of Edinburgh].
37. Berman, D. B. (2009). Do good design: How designers can change the world. New Riders.
38. Nodder, C. (2013). Evil by design: Interaction design to lead us into temptation. Wiley.
39. Benner, D., Schomakers, E. M., Machulska, A., Brück, R., Hofeditz, L., Stieglitz, S., Kunhardt, J. M., Frey, J., Heuser, I., Wilms, M., Gruber, H., Reinelt, T., Fabisch, A., Egle, U. T., Kamp-Becker, I., Renneberg, B., & Kühl, T. (2022). Ethical considerations for persuasive technologies: A systematic literature review. International Journal of Human-Computer Interaction, 38(6), pp. 549-578. https://doi.org/10.1080/10447318.2021.1960790
40. Fogg, B. J. (2009). A behavior model for persuasive design. In Proceedings of the 4th International Conference on Persuasive Technology (Article 40). ACM. https://doi.org/10.1145/1541948.1541999
41. Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. Psychological Bulletin, 125(6), pp. 627-668. https://doi.org/10.1037/0033-2909.125.6.627
42. Keller, J. M. (2009). Motivational design for learning and performance: The ARCS model approach. Springer. https://doi.org/10.1007/978-1-4419-1250-3
43. Fogg. B. J. (2025). Fogg Behavior Model How Behavior Works. https://www.behaviormodel.org/
44. Courtney E. A. (2025) Overview of Self Determination Theory. https://positivepsychology.com/self-determination-theory/
45. Goh, M. (2022). ARCS Model. https://www.linkedin.com/pulse/arcs-model-melvin-goh/
46. CARA. (2024). Cara's Exploring Page. https://cara.app/explore
47. CARA. (2024). Introducing: Cara Glaze. https://blog.cara.app/blog/cara-glaze-about
48. D'Onfro, J. (2023, June 12). Are.na is a social network built for mindfulness. Forbes. https://www.forbes.com
49. Product Identity. (2022, April 12). Are.na: Building an anti-engagement social platform. https://productidentity.co
50. CARA. (2024). Cara's app features. https://blog.cara.app/blog/caras-app-features Figure 8. Are.na. *Explore*. https://www.are.na/explore
51. Swash, R. (2024, February 14). i-D to return to print under new owner, keeping its spirit of youth and rebellion alive. The Guardian. https://www.theguardian.com
52. i-d.co. Ones in Watch Series of Reading Interface. https://i-d.co/
53. i-d.co. 5 of the best young gallery presentations at Art Basel Miami Beach Interface. https://i-d.co/article/best-of-art-basel-miami-beach/
54. Leyang, X. (2025) Visual Moodboard.
55. Satellytes. (2024). The Double Diamond and 6 phases of Design Thinking explained. https://www.satellytes.com/blog/post/design-thinking-methods-of-the-individual-phases/
56. Leyang, X. (2025) Research Framework.
57. Interaction Design Foundation. Usability Testing. https://www.interaction-design.org/literature/topics/usability-testing?srsltid=AfmBOor4_C8zobBD6ayS4x9YgP5Nrjy5WHyr-2-ydOcJs3ouz6zanOj9
58. Stickdorn, M., Hormess, M. E., Lawrence, A., & Schneider, J. (2018). This is service design doing: Using research to create better services. O'Reilly Media.
59. This is Service Design Doing. Mapping Journeys. https://www.thisisservicedesigndoing.com/methods/mapping-journeys
60. Gibbons, S & Gordon, K. (2022) UX Mapping Methods: Visual-Design Guide. https://www.nngroup.com/articles/ux-mapping-methods-visual-design-guide/
61. Meadows, D. H. (2008). Thinking in systems: A primer. Chelsea Green Publishing.
62. Jones, P. (2014). Systemic design principles and processes for the new social economy. In G. S. Metcalf (Ed.), Social systems and design, pp. 91-128. Springer.
63. Christopher, A. (2023) 16 UX Mapping Techniques to Improve Your Product Development Process. https://medium.com/design-bootcamp/15-ux-mapping-techniques-to-improve-your-product-d evelopment-process-31daa493587f

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List of articles

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