

Deloitte Center *for*
the Edge

The Metaverse in Asia

Strategies for Accelerating
Economic Impact

www.deloitte.com/sg/the-metaverse-in-asia



*2nd ITU Forum on Creating a metaverse for all through
international standards*

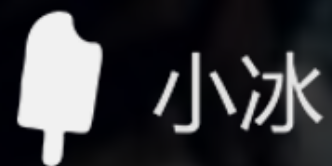


What *should* be keeping you up at night?
That is what we bring to the table.

What is created on the *edge* of technology, markets, geographies and
demographics strikes at the very heart of a business.

The next version of the
Internet *will be more*
immersive,
instantaneous *and*
intelligent





小冰

Xiaoice

An AI social chatbot

高清

说得对

Morning Flower
美丽符号

Much more than a chatbot: China's Xiaoice is built on empathetic computing which can recognise human feelings and state.

★ Xiaoice accounts for **60% of human-AI interactions by volume globally.**

The global chatbot market

**US\$5.13
Billion**

In 2022

**23.3%
per annum**

7 years, CAGR

China's innovation revolutionized chatbots by designing the ability to forge emotional connections to satisfy the human need for communication, affection, and social belonging.

Source: [Grandview Research](#)



AI Beings as a service

Xiaoice has signed deals with firms such as Huawei, Xiaomi, Oppo, Vivo, and Alibaba's TMall, and cooperations on autonomous driving with firms like Chinese electric vehicle company NIO, SAIC and Nissan



Build emotional connections

With an integration of both IQ, EQ, and personality, Xiaoice becomes a chatbot companion for users to chat with, thereby building strong emotional connections and relationships. It has over 500 million "friends" in China.



Building a social ecosystem through combining chatbot & AI

Xiaoice launched a sandbox system that allows users to participate in and build up their own social network or "island" and highly customize their own AI chatbot within the platform.

The metaverse is a
trillion-dollar
opportunity in Asia

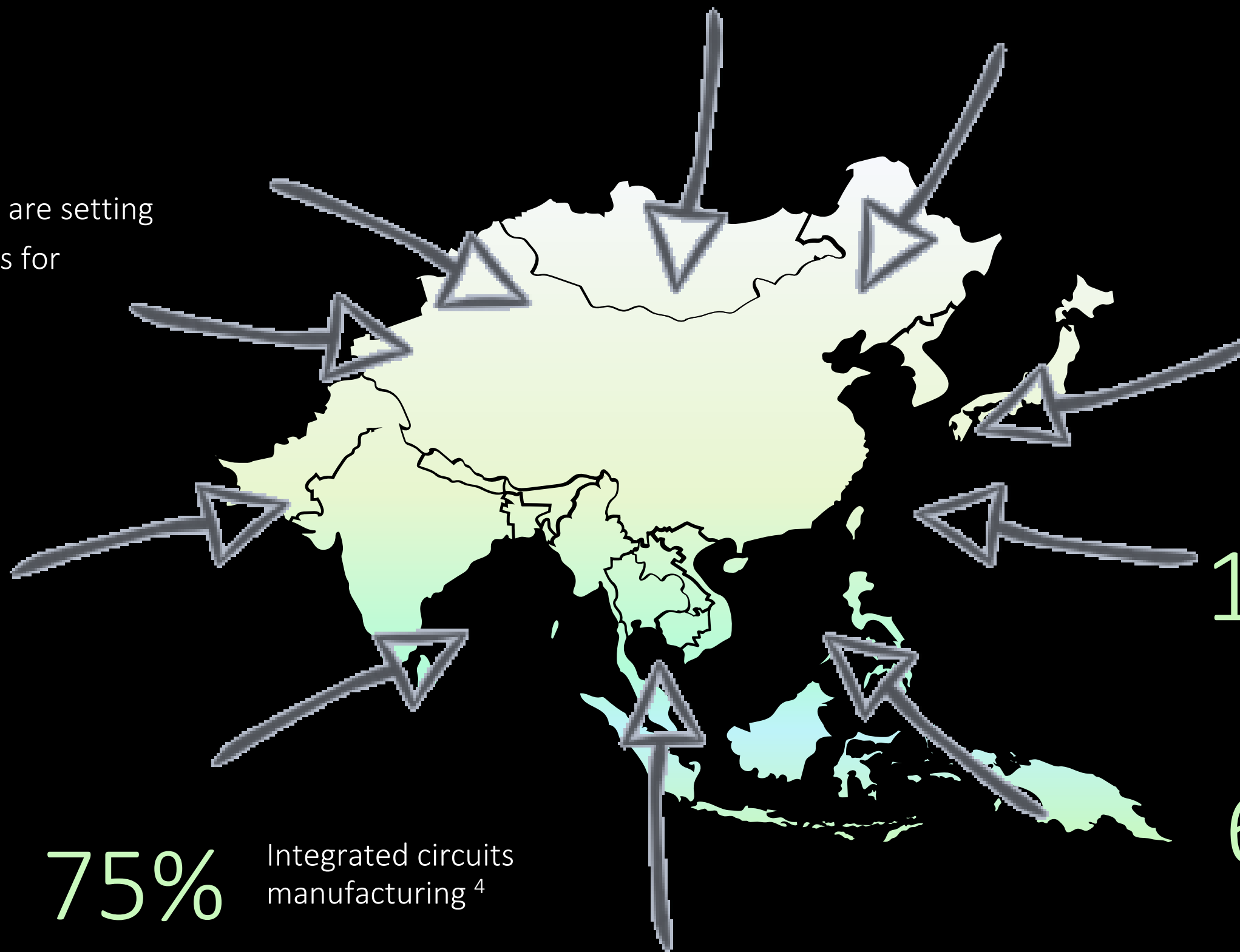


The estimated economic impact of the metaverse to Asia's GDP by 2035 is **US\$0.8-1.4 trillion per year, 1.3-2.4% of overall GDP.**



Singapore and **India** are setting up the regulatory guardrails for emerging technologies

#1: Vietnam
#2: India
#3: Pakistan
*Global crypto adoption*³



China, South Korea, and **Japan** have featured the metaverse in their economic plans

1.3bn Biggest mobile player base²

75% Integrated circuits manufacturing⁴

60% of the world's youth (15 – 24)¹

¹ United Nations ESCAP, *Youth in Asia Pacific*, 2012, p. 1.
² Statista, "Mobile gaming market in the Asia-Pacific region - statistics & facts", accessed 19 September 2022.
³ Chainalysis, *2021 Geography of Cryptocurrency Report*, 2021.
⁴ The Observatory of Economic Complexity (OEC) "Integrated Circuits.", accessed August 25, 2022.

Instructions

Go to

www.menti.com

Enter the code

36 75 85 6



Or use QR code

Team Pink



Team Blue





ETERNITY

ETERNITY

AI K-pop girl group making waves



ETERN!TY, an AI K-pop girl group exemplifies how South Korea synergises meta-human technologies and entertainment.

★ ETERN!TY is the world's first 100% AI-based virtual K-Pop girl group.



The digital human and avatar market

US\$530 Billion

By 2030

46.4% per annum

Up to 2030, CAGR

The global popularity of K-Wave has led to South Korea's dominance in the entertainment and media industry.

Source: [Emergen Research](#)



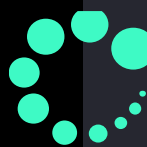
High engagement rates

The group's music videos have had more than 10 million views combined. Companies have sought out the group to be advertisers for their brand.



Increase rate of debuting new groups

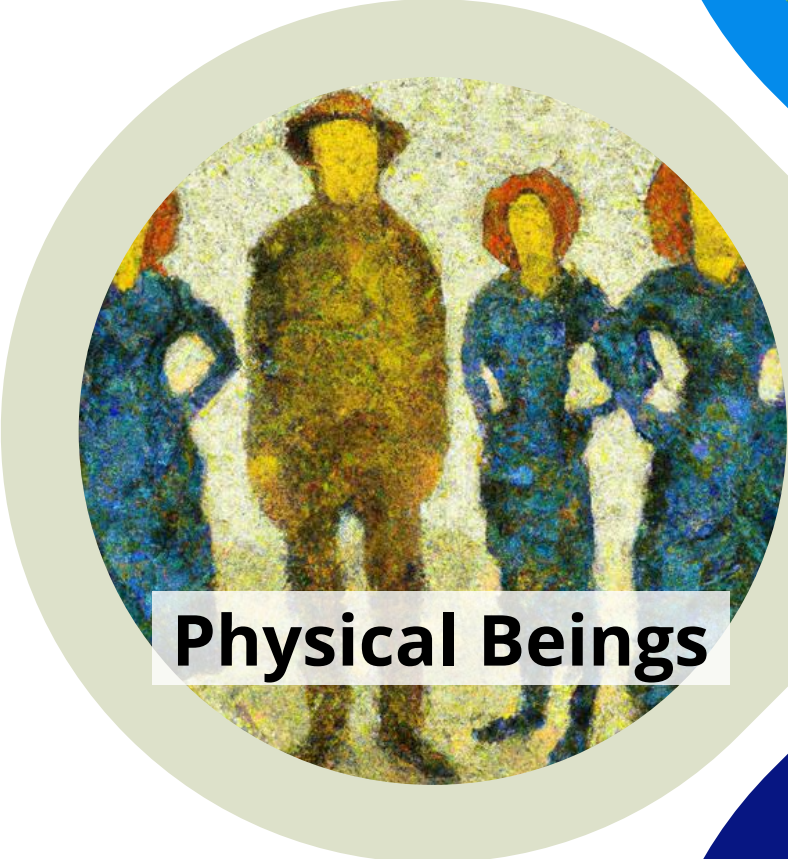
For the human stars working around the clock to train, perform and interact with their fans, having some avatar assistance in the virtual world could provide some relief. Able to create idols instead of scouting for them, and reduces training time.



Overcomes physical limitations

Eliminates risks for overstressed and pressurised human idols to keep up with ever-changing demands.

WHAT DOES IT MEAN TO BE HUMAN?



HUMANS AS DREAMERS

In each human lies a dreamer, thinking beyond the status quo, with a desire to create new things. In many ways, the next internet is primed for dreamers.



The next internet provides new tools to dream and create possibilities



Member-only story

AI Healing: Art Therapy Reinvented

Mike Messenger - Follow
3 min read · Jun 24, 2022

120 2



This image was created by writing the phrase "Never alone with you ink drawing" and sharing it with an AI known as Midjourney. This marks the beginning of a revolution. I'm not an artist by trade, and yet I created everything here.



Artist Sean Aaberg using Midjourney to create art after a stroke

But yet, an overfocus on its utility could supplant meaning

[A.I. and Chatbots >](#) | [Test A.I.'s Literary Skills](#) | [Spot the A.I. Image](#) | [What Are the Dangers of A.I.?](#) | [How 35 Real People Use A.I.](#)

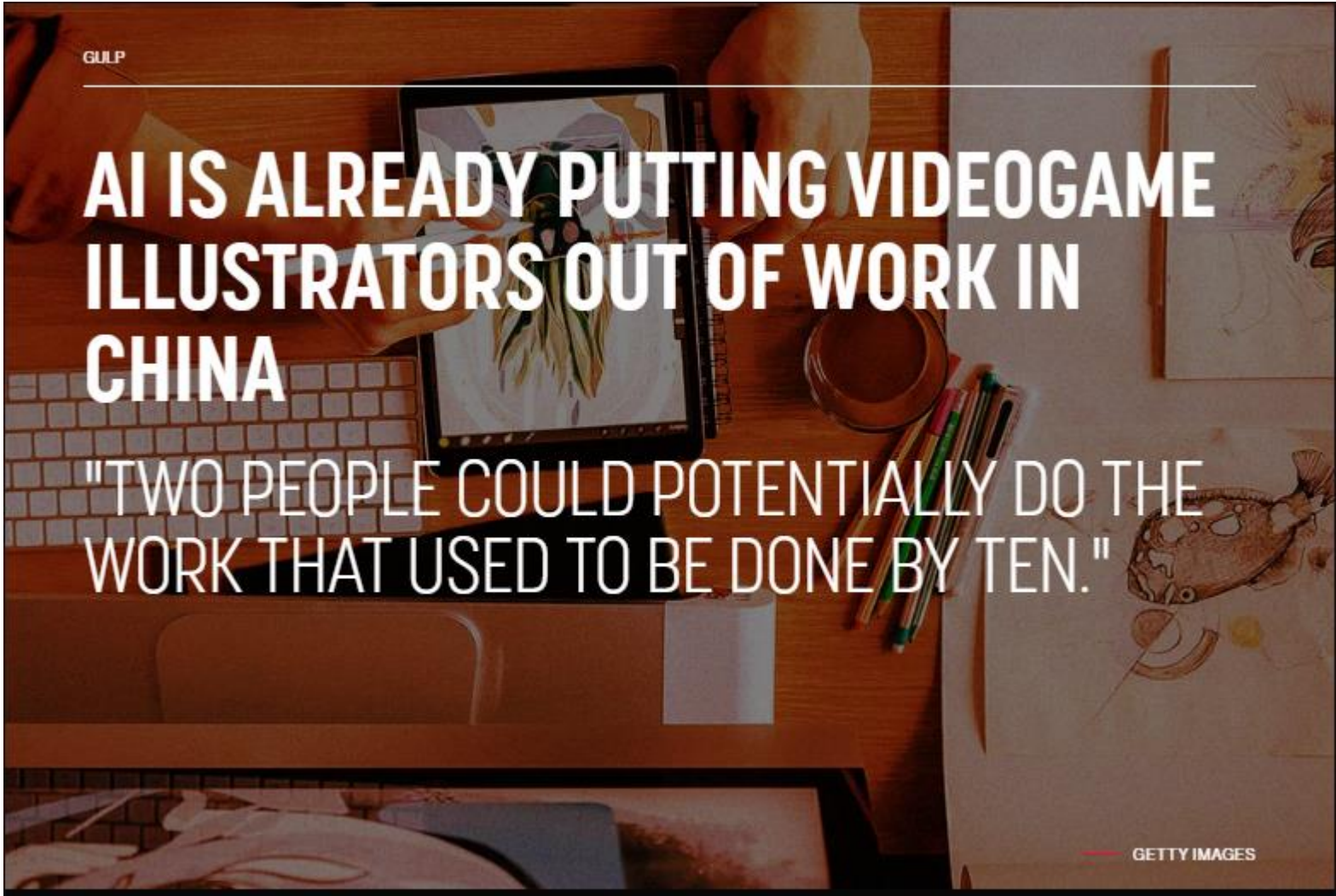
An A.I.-Generated Picture Won an Art Prize. Artists Aren't Happy.

"I won, and I didn't break any rules," the artwork's creator says.

 Give this article    1.5K



Jason Allen's A.I.-generated work, "Théâtre D'opéra Spatial," took first place in the digital category at the Colorado State Fair. via Jason Allen



Fundamental questions to ask using the lens of “humans as dreamers”

How can we ensure the next evolution of the internet balances utility and meaning, supporting rather than supplanting human creativity?

SOCIETY/USERS

- Can we design the next internet with a greater balance between meaning and utility? While users come in search of utility, can they be nudged to stay and explore meaning?
- Does the next internet replace the human quest for meaning with consumption? Will our attention be satiated by consuming more rather than seeking more meaning?
- Does this discourage artists and creators from honing their craft because there is no incentive to go above the fray of good amateurs armed with good technology?

BUSINESSES

Does the business model or technology design ...

- ... allow creators to earn sustainable income streams and share value and income risk collectively?
- ... reduce humans to instruments or datapoints to drive profit and growth?

REGULATORS

When regulating the next internet:

- Are the interests of creators and consumers balanced with the interests of capital providers like investors and businesses?
- Are digital assets and metaverse services sufficiently interoperable to curb monopolistic tendencies?
- In a world where AI can assist with many human tasks at a lower cost, are the incentives distributed fairly between human creators and AI? Will income inequality worsen?

HUMANS AS STORYTELLERS

As an art form, storytelling is as old as mankind, and can be found across almost all cultures. More than an art form, stories are internal narratives that help us both make sense of the chaotic world and relate to one another.



Our mediums for storytelling are changing

07

SPEAKING IN TIKTOK

TRENDS 2023

Apart from being the world's fastest growing social network, TikTok has created a language and culture that all networks follow. However, its influence goes far beyond the world of content because TikTok, with its algorithm, has made many discover the importance of anticipating their consumers' tastes. TikTok's formats, dynamics, and hyper-customization have transformed the music, marketing and political industry, and perhaps the video game industry as well.

The United States, as India has already done, may ban the use of TikTok. Despite all the criticism, it is the fastest growing network in the world. While it has been in the middle of controversy over China's access to people's data for years, its algorithm continues to capture thousands of new users every day, who view it as entertainment or as an escape from reality.

TikTok created a culture, a style of relating to people, and a way to connect to content. Many of the most commonly used phrases in TikTok have become part of users' everyday language, and a more friendly search space than Google itself can be for many. In fact, last August, TikTok announced that it was testing a new system to facilitate searches on its platform. Also in August, it announced that it would start a pilot including mini-games within the platform.

TikTok has also changed the way we are informed. While news consumption has declined in all formats, both traditional and digital, TikTok appears to have become the space where people today learn about the news. According to a Pew Research

<https://bit.ly/revolutionizingthedrum>
<https://bit.ly/readershipnewsxios>
<https://bit.ly/ttpilotingmingames>
<https://bit.ly/americansgetnewstt>
<https://bit.ly/tiktokimprovesearch>
<https://bit.ly/alexagettingmorepro>
<https://bit.ly/bereal2023mashable>
<https://bit.ly/fwbhennessybase1>

16



Within new mediums, what kind of stories are getting told and how are they enabled by business models?



HOME > FILM > COLUMNS

Mar 9, 2021 1:00pm PT

Taiwanese Masterpiece 'A Sun' Has Been Hiding in Plain Sight All Year (Column)

Film critic Peter Debruge's favorite film of 2020 has been widely available on Netflix since last January. Director Chung Mong-hong explains what the film says about his home country, and why this family drama is too universal to be overlooked.

By Peter Debruge ▾



Fundamental questions to ask using the lens of “humans as storytellers”

How can we guide the next evolution of the internet to preserve diversity in storytelling, prevent algorithmic biases, and empower individuals to tell their unique perspectives and stories?

SOCIETY/USERS

- Does technology determine everything we see, or do humans have the power to choose and curate our stories?
- Are there valid stories from specific groups that are systemically buried because of the invisible hand of technology and commercial interests?

BUSINESSES

Does the business model or technology design ...

- ... take in user and stakeholder inputs on whose stories are heard and whose are valid?
- ... diminish authentic human culture with digital simulations?

REGULATORS

When regulating the next internet:

- Are there sufficient governance mechanisms to prevent echo chambers and the spread of mistruths, while preserving freedom of expression?

HUMANS AS SOCIAL AND MORAL BEINGS

Humans are social beings – biologically hardwired for interpersonal connections. To be able to relate to one another, humans rely on shared beliefs, values, customs, and behaviours.



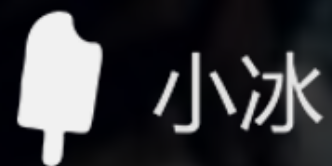


ETERNITY

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AI K-pop girl group making waves





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Fundamental questions to ask using the lens of “humans as social and moral beings”

As we advance into the next internet, how can we effectively balance the need for regulation and decentralized control to ensure the safeguarding of our inherent social norms and moral values?

SOCIETY/USERS

- How might the next internet affect the dynamics of human relationships, and could it lead to a significant shift toward machine-oriented relationships?
- Does the next internet abdicate moral decisions to robots and autonomous systems, and what kind of moral codes are encoded into platforms we interface with?

BUSINESSES

Does the business model or technology design ...

- ... provide users with a level of choice such that human beings are not governed or directed by technologies like AI and Internet of Things?
- ... involve a representative group of stakeholders in the governance of the business or specific technologies?

REGULATORS

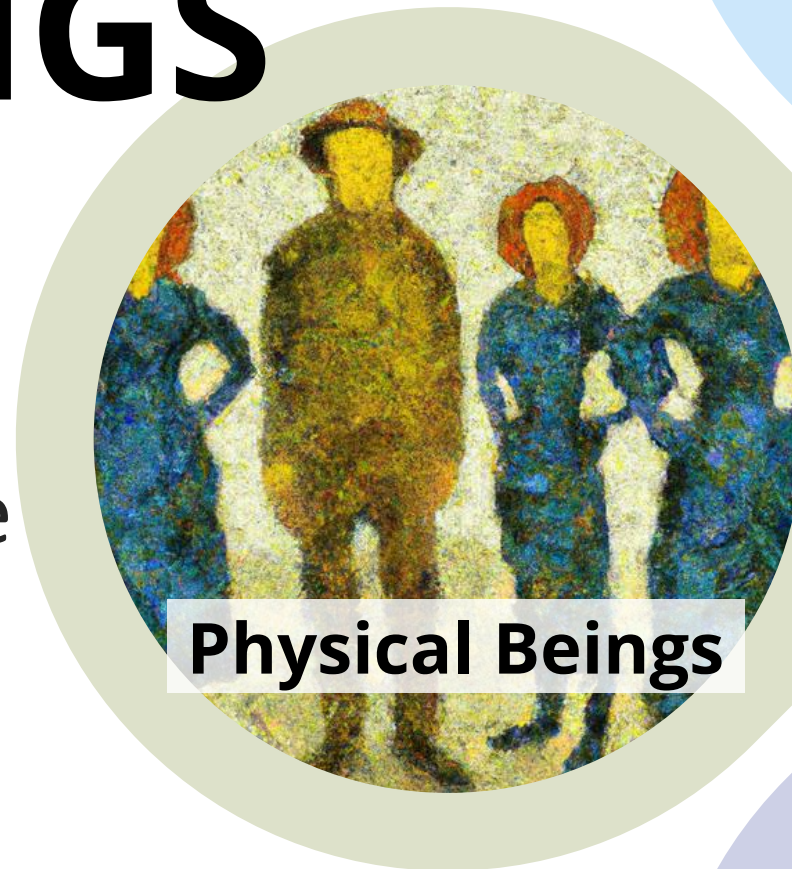
When regulating the next internet:

- Is inclusion baked into the design or is it an afterthought?
- Is civic space to resolve clashes in values and beliefs preserved?
- Are important moral debates and democratic processes overtaken or oversimplified by algorithms and virtual townhalls?
- How much of an “intent to mislead” is considered malicious when tools for creating photorealistic images and videos are accessible to the general public?

HUMANS AS PHYSICAL BEINGS

Will our virtual selves be an extension of our physical selves, or will the internet be a form of escape from the physical world?

As more of our lives are spent online, our relationship with our physical environments and our relationship with our physical bodies will evolve.





NUHS 
National University
Health System

NUHS Holomedicine

Using mixed reality technology to enhance patient care

The use of technology will augment the way we interact with our physical bodies.

**Deloitte
Review**

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COMPLIMENTARY ARTICLE REPRINT



Technologies that touch you

by Maggie Woolf, Steve Hatfield, and Duleesha Kulasooriya

ILLUSTRATION BY JON KRALUSE

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Insights

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FIGURE 2

Transformative solutions are built on an array of foundational sciences



Major methods of measurement

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> • Heart rate/heart rate variability • Breath rate/CO₂ levels • Muscle movement/tension • Body movement/temperature • Skin conductance • Body fluid composition • Electroencephalogram | <ul style="list-style-type: none"> • Posture • Galvanic skin response • Sleep quality/quantity • DNA/RNA/biome • Eye tracking • Hormones • Inflammation | <ul style="list-style-type: none"> • Blood pressure/glucose • Mood/meaning tracking • Pattern/behavior recognition • Emotion detection • Voice/tone/word recognition • Facial recognition |
|--|--|---|

Enabling technologies

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> • Artificial intelligence/machine learning • Robotics • Pattern/emotion recognition • Advanced sensors/mobile | <ul style="list-style-type: none"> • Networks • Massive data sets • Biotechnology • Bioinformatics • Nanotech | <ul style="list-style-type: none"> • Digital fabrication • Augmented/virtual reality • Blockchain |
|--|--|--|

Underlying research domains

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> • Neuroscience • Medicine • Genetics • Physiology • Behavioral psychology | <ul style="list-style-type: none"> • Behavioral economics • Awe/flow • Compassion • Resilience • Meditation | <ul style="list-style-type: none"> • Happiness/meaning • Immersion (AR/VR) • Affective computing • Persuasive computing |
|---|--|---|

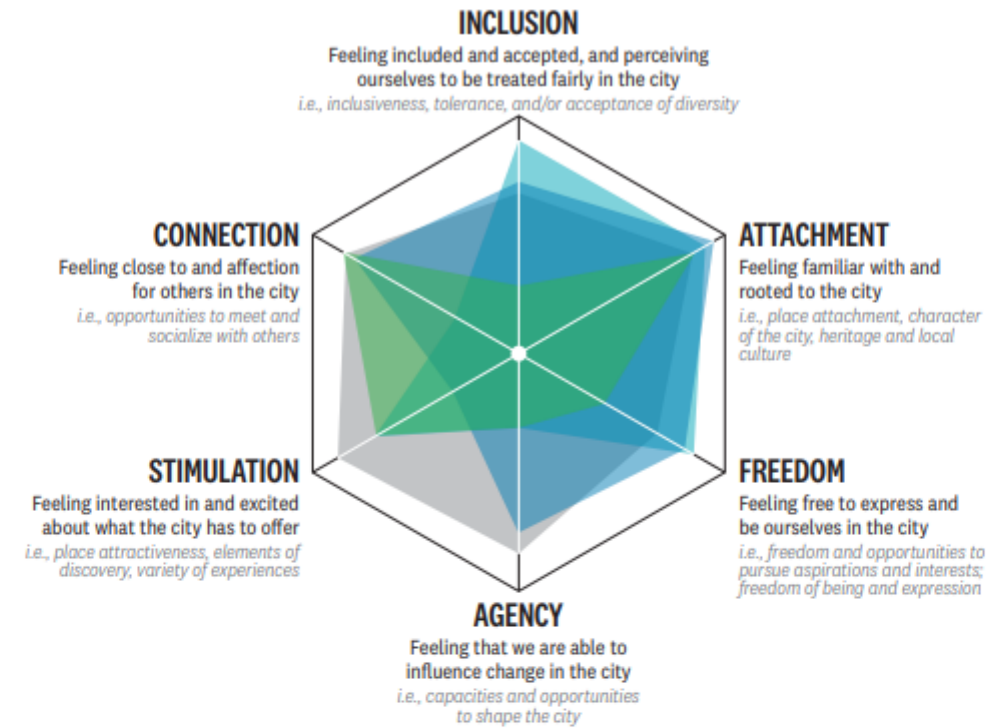
Source: Nichol Bradford, Transformative Tech Lab.

How will our relationship with our physical environments evolve in a more phygital future?

THE LOVEABLE SINGAPORE PROJECT

A study to discover what we love about Singapore and what would make us love Singapore more

Organised by Supported by NATIONAL DESIGN CENTRE In partnership with CENTRE for Liveable Cities SINGAPORE Deloitte Center for the Edge HOUSING & DEVELOPMENT BOARD NUS PID PARTICIPATE IN DESIGN URA Urban Development Authority In support of SG TOGETHER



| PERSONA A Unloved but attached | PERSONA B Loving but unengaged | PERSONA C Loved but unengaged | PERSONA D Loved and engaged |
|--|---|--|--|
| <p>Persona A often feels excluded or marginalized in some way.</p> <ul style="list-style-type: none"> This affects their ability to move about freely in Singapore, metaphorically but also sometimes literally. This persona would feel stuck, and thus low on agency. They may also be anchored by nostalgia, personal history, and a sense of heritage. They therefore score higher on the attachment and stimulation fronts. | <p>Persona B may personally feel included in Singapore but is disturbed by injustice in society. This group is likely to see others being excluded, impacting their perception of Singapore's lovability.</p> <ul style="list-style-type: none"> Their sense of connection is high, as this group is driven by social justice and connection. They want to take action, but it might not be clear to them how to do so. Their sense of agency is therefore lower. | <p>Persona C has been treated fairly well and lives a good life. This is what's most important to them.</p> <ul style="list-style-type: none"> They have a high sense of freedom and inclusion, but their sense of agency is on the lower side, though they often do not feel this is important. This group may be uncomfortable with societal change. The group's stimulation is negatively affected by stress. | <p>Persona D represents those who believe that Singapore is home no matter what.</p> <ul style="list-style-type: none"> They feel a sense of attachment and agency. Those who fall in this group also tend to be involved in grassroots and volunteer work. They are doing well in their own lives, so they feel free to be themselves in wider society. |

Fundamental questions to ask using the lens of “humans as physical beings”

How can we harness the potential of the next evolution of the internet to enrich our physical lives and experiences, while fully engaging with and enhancing our digital identities in a balanced, beneficial way?

SOCIETY/USERS

- Does the next internet seek to minimize human flaws just to make a better fit with technology?
- Does digital convenience and efficiency lead to the deterioration of our physical and mental health?
- How can the internet and its technologies bring better awareness to our internal workings to nudge us toward human flourishing?

BUSINESSES

Does the business model or technology design ...

- ... build in and look after the interests of the voiceless, e.g, children, the marginalized, and the environment?
- ... guard against irresistible incentives for users to prioritize their digital identities, relationships, or environments to the detriment of their physical ones?

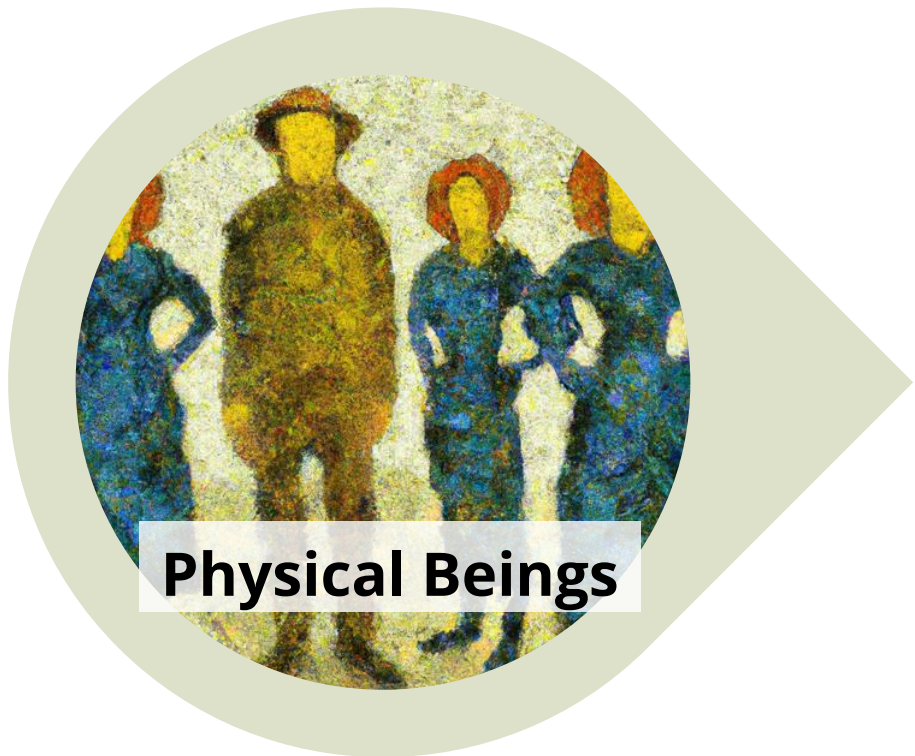
REGULATORS

When regulating the next internet:

- Are there enough ground-up initiatives to create more human and lovable* physical spaces in a future where digital and physical experiences become even more blended?
- Does the design of virtual spaces prioritize efficiency and incentives over authenticity, diversity, and safety?
- Do people have the right to disconnect, given the incentives to be “always on,” in a persistent metaverse?



Dreamers



Physical Beings

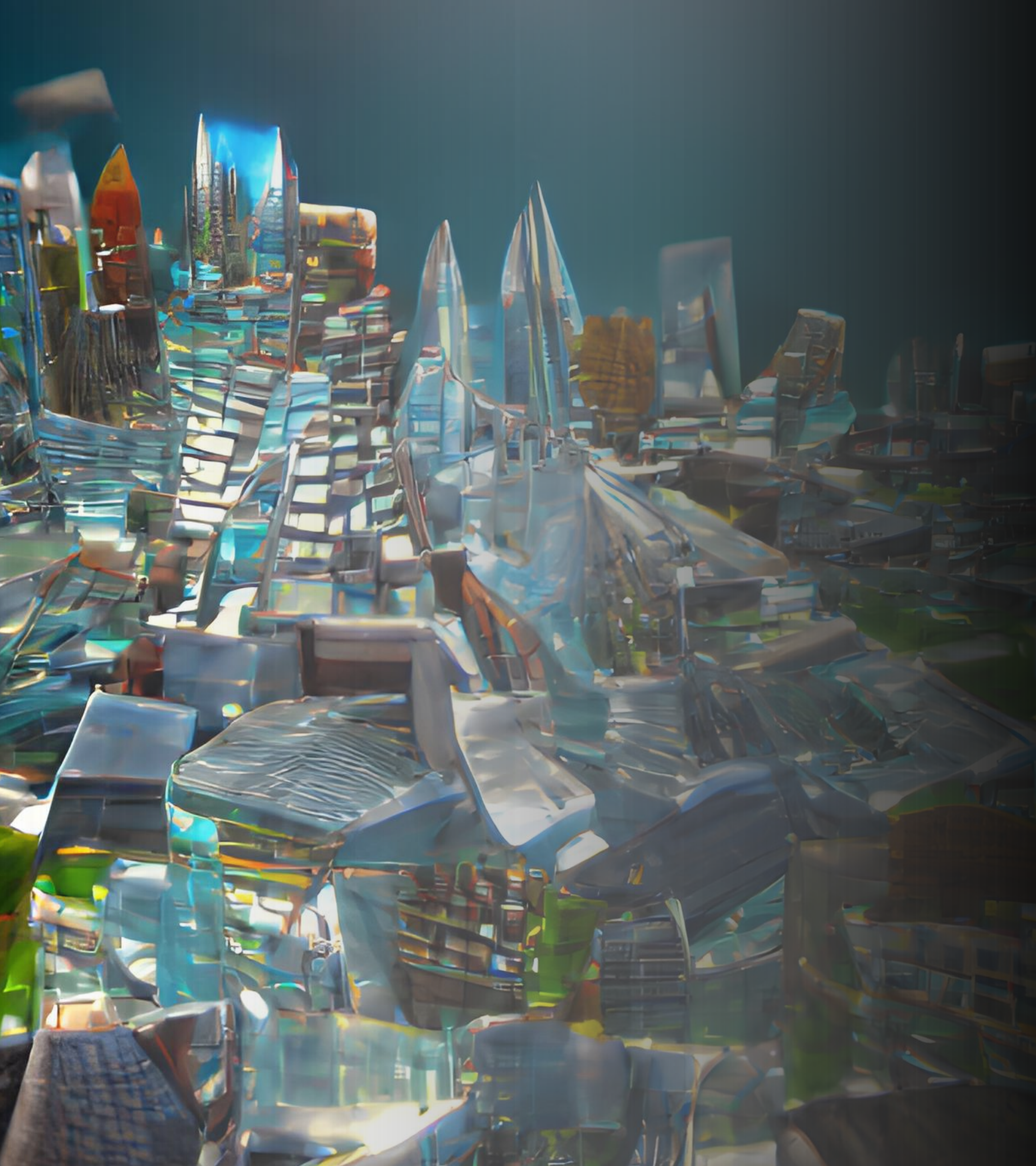
WHAT DOES IT MEAN TO BE HUMAN IN A DIGITAL WORLD?



Storytellers



Social and Moral Beings



While the metaverse is inevitable,
a human-centered metaverse
is not.

*How do we create a
metaverse for all?*



Michelle Khoo

Center Leader, Deloitte Center for the Edge



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The future is
already here.

What will you do?