

# THE HUMAN IN DIGITAL: OPPORTUNITIES FOR SINGAPORE DESIGN

Spotlighting trends and opportunities in the intersection of design x digital

## INTRODUCTION

The pandemic has significantly accelerated digital transformation across all spheres of “live, work, play”, impacting businesses and individuals. For businesses, 70% of respondents in an international poll agreed that Covid-19 had significantly hastened the adoption of online tools, speeding up digital communication strategies by six years, and compressing years-long digital transformation road maps into mere weeks.<sup>1</sup> For people, digital adoption could turn out to be a lasting behavioural shift persisting beyond Covid-19 – McKinsey’s sentiment poll showed that 75% of first-time users of digital channels indicate that they will intend to continue using them after things return to “normal.”<sup>2</sup> Harvard Business Review noted: “A study on habit formation suggests that the average time for a new habit to form is 66 days, with a minimum of 21 days. As of this writing, the lockdown has already lasted long enough in many countries to significantly change habits that had been the foundation of demand and supply.”<sup>3</sup>

These developments are not lost on Singapore designers, whom in an industry survey conducted by Dsg in June 2020, said that the greatest long-term impact of Covid-19 is the “digitalisation of industries”. Their business response to Covid-19 mainly centred around digitalisation, such as embracing digital tools and collaboration, diversifying into omnichannel platforms and new digital offerings, and piloting new remote and distributed working.

DesignSingapore Council (Dsg) thus created this thinkpiece exploring the intersection of digital technology and design, and in particular around these 3 questions:

1. **What is digital x design:** How does digital and design meaningfully intersect? Where will digital technology most alter our lived experiences, and how does design add value to that?
2. **Where this will play out most** in terms of sectors, and where Singapore design might already have a competitive edge?
3. **What does this mean for designers?** What kinds of perspectives and skills would designers need to be successful in this future?

Our research methodology consists of: (1) desktop research from industry trend reports, studies and news reports; and (2) interviews with seven industry experts in the fields of digital design, business, and strategic futures. This thinkpiece represents early findings, and is our framing to invite conversations and delve into further research. We invite you to share your feedback and your thoughts with us at [research@designsingapore.org](mailto:research@designsingapore.org).

## WHAT IS DIGITAL X DESIGN?

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<sup>1</sup> The Straits Times, “[Covid-19 pandemic has sped up digital transformation in firms: Study](#)”, 21 July 2020

<sup>2</sup> McKinsey, “[The COVID-19 recovery will be digital: A plan for the first 90 days](#)”, 14 May 2020

<sup>3</sup> HBR, “Adapt Your Business to the New Reality”, Sep-Oct 2020

*How does digital and design most meaningfully intersect? Where will digital technology most alter our lived experiences, and how does design add value to that?*

**[TLDR] The key impact of digital technology can be thought of in 2 ways: it enables us to “bridge space and time at scale”, and allows the mass personalisation to the Segment of One. While digital technology is the means or the tool, design is the process or represents the end-state by which people experience improved function and performance.**

Digital allows us to transcend time and space by putting us in real-time connection with each other, with products, services and information – no matter the location or the hour. The American Institute of Graphic Arts (AIGA) points out that not only do people toggle between online and “real life”, they also toggle between different devices, or across different platforms on the same device, and “it is in the gaps between online and offline environments, between device, and between related services providers that users often lose support.”<sup>4</sup>

Secondly, technology today has enabled the hyper-personalisation of solutions, at scale – Richa Menke, Director of Strategic Design at BCG Digital Ventures noted, “*a segment of one*” – particularly in areas such as wearable tech and holistic wellness. Accompanied by growing comfort with online shopping and tools, as well as technologies like 3D-printing, high-speed data transmission, networked production systems that are becoming more commonplace and lower in cost, the **new phase of customisation is able to push beyond aesthetics** like choosing colours, but instead offer features unique to the customer, such as the shape of hands, feet or personalised skincare.<sup>5</sup> Demand for such services is healthy - the Configurator Database Project, an aggregator platform for web-based customization tools, currently lists 1400 companies across 17 different industries.<sup>6</sup> Many are smaller and more nimble outfits – niche manufacturers and start-ups, unencumbered by legacy factories and complicated supply chains. This means there is much more room for mass customization to be scaled up.

**How should design then interplay with digital capabilities?** What we have heard unanimously from our interviewees and our research findings is that infusing humanity – designing for the human experience – into technology is essential for us to embrace digitalisation without losing community and connection.

Menke noted, “*The promise of tech was connection, but it has not delivered.*” This is observation has definitely been exacerbated as Covid-19 accelerated adoption of digital tools, leaving people with no choice but to use tech to replace physical exchanges and dynamics. Our interviewees opined that even before the pandemic, the sense of community and connection in urban life had been on the decline, with fewer possibilities for empathy, understanding and authentic connections between individuals. The first critical role for designers in digital space is therefore to think: **how can we make technological advances without losing human connection?**

The second role for designers to is always ensure that **the digital option exceeds its alternative** – “*either figure out how to bring high-touch to what would otherwise be low-touch, or do what digital can do that physical can’t.*” as one interviewee pointed out. The

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<sup>4</sup> AIGA, “[Bridging Digital and Physical Experiences](#)”, Accessed 15 Jan 2021

<sup>5</sup> New York Times, “[Customers Want Customization, and Companies Are Giving It to Them](#)”, 18 March 2020

<sup>6</sup> [The Configurator Database](#), accessed 30 Dec 2020

MIT Mobile Experience Lab has been experimenting with what this could look like, interrogating the definition of “smart” tech, which is “not just smart in using digital technology, but smart in not allowing that technology to disconnect us from each other as it is seeming to connect us.” Their experimentation areas form an inspiring palette of ideas: building trust and engagement through wearable tech, crowdsourcing ideas via apps to create community change, using digital tools to strengthen people’s connections to their physical space, exploring the Smart Home that is connected to its neighbours and neighbourhood.<sup>7</sup> In our local context, our interviewees have pointed out the untapped possibilities for the role of design – designing of e-commerce aggregator platforms, tele-services, technologies such as VR to improve remote team or meeting experiences, and personal wellness.

The third role of designers is to **translate data into needs and ultimately, into meaningful experiences**. Many business applications today “aren’t really designed to listen, they’re designed to convert,” notes Salesforce futurist Brian Solis. While customers are extensively profiled through data collection, most businesses are still talking at customers rather than to them, competing for attention to pull them through the sales funnel. This is a missed opportunity, as Solis writes: “We must use technology to listen to data with the intent of doing more than converting. Conversions are merely an outcome of a meaningful experience—so are relationships.”

Our interviewees echoed this, urging designers to step into this gap and “*establish robustness for listening to stakeholders*”. Such processes of listening and co-creating are intrinsic to the design process – if designers can co-opt available technology in data and personalisation in these processes, they can offer significant value in transforming customer experiences.

Finally, the fourth role of designers is to constantly advocate for closing the functionality gap. With much of our day spent on, and many functions being carried out on digital platforms, AIGA notes, “users often lose support, unnecessarily repeat actions, or miss information important to completing a task.” These experience gaps interrupt the continuity of the brand, product, or service experience, and is only set to accelerate as digitalisation accelerates.<sup>8</sup>

## WHERE WILL DIGITAL X DESIGN PLAY OUT MOST IMPACTFULLY?

**[TLDR] Our experts and our research shows these are the following sectors whose growth will be accelerated by digital technology in the next 5 years, AND where design will make a significance difference in the experience, and hence, adoption. They are: teleservices (especially remote work, healthcare and learning); lifestyle and entertainment; smart built environment and urban sustainability; e-commerce and aggregator platforms will continue their growth trajectory. Undergirding all sectors are designing better for ESG (Environment, Social and Governance) and Diversity and Inclusion issues – in other words, a more thoughtful growth.**

### 1. Tele-services

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<sup>7</sup> Federico Casalegno, “[Designing Connections](#)”, 2019

<sup>8</sup> AIGA, “[Bridging Digital and Physical Experiences](#)”, Accessed 15 Jan 2021

The pandemic and the resulting travel and social gathering restrictions had forced healthcare, business and commercial activities to accelerate digital transformation, spurring new behaviour and use of digital tools at a staggering scale previously unimagined. The biggest areas of change and adoption have been in the domains of work and healthcare. As one of our interviewees puts it, *“Tele-everything – if it was a cliché before, it is a requirement now.”*<sup>9</sup>

### Remote Work

The pandemic and tremendous digitalisation of life had enacted new stressors on a mass scale – frictions in the home, decreased work-life balance, impacts on mental wellbeing and wellness. In a survey of more than 3000 respondents, the National University Health System (NUHS) Mind Science Centre found that 61% of those working from home reported feeling stressed out while working, and 51% reported feeling stressed out during their off-work hours at home.<sup>10</sup> Concerns around privacy and trust have also risen<sup>11</sup>. As remote work arrangements become increasingly prevalent, **users may be keen to return to post-pandemic “normalcy” and the familiarity of physical experiences, where interactions and connections are effortlessly seamless and engaging.**

However, our interviewees noted that the technology behind video conferencing and related tools had glaringly yet to come close to the experience of face-to-face, where there is spontaneity and ease of connection, and the serendipity of encounters – *“Trust is built in between meetings”*, as Menke noted. Glimpses into what the future of blended work can be seen from explorations with Virtual Reality (VR), which one shared that VR was used to bring a much-appreciated immersive element to a virtual contract negotiation session. Technology like Oculus Rift which was originally intended for video gaming are now being explored to make remote work feel less remote. We think that “work from anywhere” (WFA) is here to stay.

### Healthcare

The demands of tele-services for healthcare have also been accelerated – global technology research and advisory Technavio recently put out a report estimating that the pandemic will push the tele-medicine market at a compound annual growth rate of almost 19% between 2020 to 2024<sup>12</sup>. They further identified one of the main drivers behind this growth to be the integration of AI with telemedicine.

The types of demands for telehealth services also look to get more sophisticated and broader, as pre-pandemic trends like “healthcare without walls” and blended physical and virtual healthcare platforms become accelerated. Global design and architectural firm HOK’s medical planning team noted that **healthcare is going to be ubiquitous and “exist in an omnipresent space” – people will demand healthcare anywhere, anytime.** This is supported by the growth of cost-effective, convenient digital resources like health apps and wearables.<sup>13</sup> For example, private sector apps had been used in China and France (eg.

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<sup>9</sup> Quotes from our seven expert interviewees are indicated in italics to differentiate them from quotes taken from literature review. Where preferred, the identities of our interviewees have been kept anonymous by prior agreement.

<sup>10</sup> TODAY, [“Singaporeans working from home more stressed out than frontliners: Survey”](#), 20 August 2020

<sup>11</sup> Forbes, [“Beware: Remote Work Involves These 3 Cyber Security Risks”](#), 10 April 2020

<sup>12</sup> Businesswire, [“COVID 19 COVID-19 Impacts: Telemedicine Market Will Accelerate at a CAGR of Almost 19% Through 2020-2024”](#), 5 Aug 2020

<sup>13</sup> HOK, [“Top 4 healthcare design trends that will shape medical planning in the 2020s.”](#) 14 Jan 2020

Doctolib) to help navigate the healthcare sector, and make patient journeys seamless and connected. Covid-19 has helped people leap the hurdle of telehealth.

The role of designers in re-designing processes, spaces and services could lead to significant new value, convenience and cost savings for both healthcare providers and patients.

### Learning

One of the greatest impacts of the global lockdown was the spur to bring learning online. As educators grapple with the immediate needs of adapting existing curriculum for online classes, others are already looking ahead to see how e-learning might look in future. Singapore's Skills Development Group has identified the need for effective design of e-curriculum and integration of technologies (e.g. AI in learning; blockchain for assessments) that isn't just "lipstick application" but, part of an entire ecology and new business model – noting that what the physical-digital hybrid for learning will be is yet undefined. New specialised roles are emerging too, in the wake of home-based learning – learning tech designers, career guidance professionals in e-learning and e-employment, integrators for tech and education, and even mental health professionals for digital platform users.<sup>14</sup>

Tighter pipeline development is also needed, with a more futures-oriented thinking, to better identify and deliver relevant talent and skills to industries looking to transform in the post-pandemic world. This is all the more relevant given LinkedIn's observation that skills (especially hard skills) face obsolescence in just five years.<sup>15</sup>

## **2. E-commerce, and related aggregator platforms**

Deloitte's strategy paper for ecommerce noted that the world can look to the development in China as an indicator of what is to come: nationwide efforts to contain the epidemic outbreak in China have significantly altered consumers' daily habits, consumption patterns, and ways of thinking, resulting in a boost to the "home economy" and a further improvement in existing online services. Across different consumption categories, online demand has increased, especially in terms of food and beverages and entertainment delivered using innovative non-contact formats.<sup>16</sup> This shift is corroborated by KPMG's international consumer surveys showing that one in five consumers report that they shop for groceries at online stores (35% for non-grocery), and intend to continue post-pandemic – almost one in two consumers who changed their shopping habits claimed that their new behavior will persist.<sup>17</sup>

This paints a picture of growing demand for ecommerce usage that is likely to stick around in the new normal. Areas for improving ecommerce experience include how companies can more directly engage (and relate to) their consumers, especially as consumers still subconsciously expect digital experiences to fulfill the expectations that only physical interaction during transactions can offer.<sup>18</sup> Customers are also asking for – and expecting – seamless omnichannel experiences, which points towards the need to review channel mixes

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<sup>14</sup> Skills Development Group, "Re-imagining the way we live, work and learn post-Covid", Jun 2020

<sup>15</sup> LinkedIn, [LinkedIn Learning 2020 Workplace Learning Report](#), 2020

<sup>16</sup> Deloitte, [Ecommerce Strategy Paper](#), 2020

<sup>17</sup> KPMG International, ["Consumers and the new reality"](#), June 2020

<sup>18</sup> <https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/technology-media-telecommunications/deloitte-cn-tmt-inclusion-en-200924.pdf>

and fulfil basic expectations of working across different devices.<sup>19</sup> In light of this, **the opportunity arises for designers to refine the e-commerce consumer experience.**

Another important e-commerce trend is the **increased interest and support for local retailers.** Of those who will prioritize shopping locally, about nine in 10 said they would pay more for local products, because their spending would have a noticeable impact on the local economy and also because they can trust the provider. KPMG noted, that this is also “bound up in a much greater sense of place, community spirit and concern for the environment with respondents wanting to see greater support from retailers for local communities and nearly one in four interested in their own region's products.”<sup>20</sup>

### 3. Lifestyle and Entertainment

One of our interviewees predicted that the lifestyle sector, extended to include tourism and entertainment, would expand in the new normal as **consumers look for ways of escaping from a mundane or disenchanting present.** More specifically, this expansion is taking place amongst providers who have been able to offer home-based products, services and experiences (streaming, online games, e-books, etc). In-home entertainment has particularly seen unprecedented growth – Disney+ has gained 60.5 million subscribers by August 2020, hitting its five-year target in eight months; Netflix saw 16 million new subscribers in the first quarter of 2020 alone.<sup>21</sup> Other home-based leisure activities like gardening, baking, and DIY have also seen an uptake.<sup>22</sup>

This is naturally quite closely tied to e-commerce capabilities as well, for lifestyle and entertainment purchases that can be made online. Social media-based commerce (or “social commerce”) is on the rise too, especially during the Covid-19 outbreak where people seek greater social interaction on these platforms. TikTok’s partnership with Shopify has empowered businesses to engage with younger audiences and drive sales from a novel angle. Businesses gain access to offer native and shareable content like In-Feed ads, to offer more seamless shopping experiences for customers.<sup>23</sup>

On the other hand, live entertainment and leisure venues that require customers to show up physically (like theme parks, cinemas, attractions, etc) have, unsurprisingly, taken a huge hit. Not only did they close during lockdown, they are forced to operate at limited capacity after reopening due to safe-distancing measures.<sup>24</sup>

For the former to continue thriving, and for the latter to survive, **lifestyle and tourism experiences that provide the “hyper-local” and “hyper-authentic” will be in higher demand.** Working across sectors would also be another lasting solution - a well-thought entertainment strategy should fuse the F&B offer and retail, thus transforming a more typical retail centre into a “lifestyle destination” offerings that can exist physically as well as online.<sup>25</sup> And of course, for physical and blended-experience venues, prioritising safety is paramount.

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<sup>19</sup> KPMG International, “[Consumers and the new reality](#)”, June 2020

<sup>20</sup> KPMG International, “[Consumers and the new reality](#)”, June 2020

<sup>21</sup> LDP, “[Covid and Beyond: The Evolving Relationship of Leisure and Retail](#)”, Aug 2020

<sup>22</sup> Aviva, “[Covid-19 Impact on Home and Leisure](#)”, Oct 2020

<sup>23</sup> <https://techcrunch.com/2020/10/27/tiktok-invests-in-social-commerce-via-new-shopify-partnership/>

<sup>24</sup> LDP, “[Covid and Beyond: The Evolving Relationship of Leisure and Retail](#)”, Aug 2020

<sup>25</sup> LDP, “[Covid and Beyond: The Evolving Relationship of Leisure and Retail](#)”, Aug 2020

Our interviewees noted that the sectors will thus also see their traditional hierarchies overturned, where smaller, more nimble players can respond quickly and adjust their offerings according to shifts in demand. Simultaneously, larger, more established players may struggle without their usual stakeholders and partners. Ultimately, if players can adjust to produce better content offerings and build networks, these sectors would emerge stronger and appeal more to both local and international consumers as the pandemic eases.

#### 4. Smart built environment and urban sustainability

There is renewed focus on built environment and urban life. Interviewees highlighted that COVID-19 would fundamentally transform expectations of the built environment and urban life, in a manner similar to how air travel and security standards were permanently transformed following the events of 9/11. New issues like identity protection, contact tracing, and access to places would come to the fore for designers.

In a discussion on how design can shape a post-Covid society, UK Design Council brought together experts who spotlighted the role design can play in reshaping spaces, for example, the use of data and spatial mapping to match the most vulnerable groups with public assets; designing reconfigured traffic flows in public spaces for safe distancing; repurposing unused buildings (especially offices); designing sharing platforms that facilitate grounds-up and community-based responses.<sup>26</sup> Indeed, **the question of making the built environment safer in a post-pandemic world has come to the fore amongst architects, interior designers and urban planners.** The US National Institutes of Health recently launched a study to examine the future of post-pandemic public spaces, housing, office spaces and building and construction methods, to ask the question of what an anti-pandemic built environment could look like – taking into account potential transmission dynamics of infection to create a “smart environment”.<sup>27</sup>

The global nature of this transformation and its contextualisation thus present huge opportunities for service and experience design practitioners, not only architects and spatial designers. Singapore should be on the look-out for areas to “win”, like design for safe distancing, contact tracing and building a pandemic-resilient built environment.

#### 5. DEI and ESG issues

The urgency of climate change and sustainability impacts all businesses and designers, even digital designers. Interviewees noted that climate change and sustainability are massive global challenges that highlight the interconnected, interdependent nature of humanity. **Individuals and corporations are increasingly invested in carbon footprints of their actions and consumption patterns, and thus so should designers consider the environmental implications of their designs.**

A McKinsey report noted that ESG and DEI concerns are more than just a feel-good exercise, but part of an “emerging zeitgeist”. ESG-oriented investments were at \$30 trillion in 2019, an increase of 68% since 2014. This has been fueled by growing social, governmental, and

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<sup>26</sup> UK Design Council, [“How the design of places can support the COVID-19 emergency and shape a post-crisis society”](#), 2020

<sup>27</sup> US NLM NIH, [“Antivirus-built environment: Lessons learned from Covid-19 pandemic”](#), Oct 2020

consumer attention on the broader impact of corporations, as well as by the investors and executives who realize that a strong ESG proposition is closely related to long-term business success.<sup>28</sup> In the wake of the Covid-19 break, this drive shows signs of intensifying - in Q1 2020, (early stages of the crisis), 44% of sustainable public equity funds saw top-quartile performance.<sup>29</sup> DEI (Diversity, Equity and Inclusion) and ESG (Environmental, Societal and Governance) are also no longer relegated in business to CSR or marketing departments, but are becoming a key prong in growth, strategy and talent attraction.

Even digital designers must consider the impact of their designs on the environment. Recent research from Dassault Systèmes found that Covid-19 caused 38% of organisations globally to reduce their focus on environmental sustainability, while 18% put it on hold completely. On the other hand, the same survey found 46% of organisations have increased their focus on digitalisation.<sup>30</sup> Gerry McGovern, author of *World Wide Waste* has pointed out that we are in a different sort of pandemic besides Covid-19: the “pandemic of data”. Estimating that 90% of data is never used, and that most organisations run on 10% of their IT applications and servers, he cautions that the digital is very much tied to the physical, for example, “231 million trees would need to be planted to deal with the pollution caused as a result of the data US citizens consumed in 2019.”<sup>31</sup>

On Diversity and Inclusion, UN Secretary-General António Guterre highlighted how the pandemic had disproportionately impacted those already disadvantaged in terms of physical ability, income, gender and age, and called upon design to offer solutions: “We have an opportunity to design & implement more inclusive & accessible societies.”<sup>32</sup>

Our interviewees also noted that designers are well-positioned to address DEI and ESG issues, but need to develop an ecosystems-based approach for systems-based solutions. Amongst our interviewees, the general sentiment was one of urgency – that if Singapore does not hustle to drive and lead in these areas, “*it will miss the boat*”.

## WHERE IS SINGAPORE’S EDGE IN DIGITAL X DESIGN?

**[TLDR] Design can power Singapore’s next radical push for digital innovation in healthcare, advanced manufacturing and environmental sustainability. Design can also help to incrementally improve the service delivery in e-commerce and logistics. But the main ingredient in Singapore’s design edge is trust – our small size, coupled with strong governance and emphasis on quality, makes Singapore the perfect test-bed for new solutions that can be exported to the world.**

Designers need to be plugged into Singapore’s broader economic direction, through sectors and high-profile projects with major investment by the public and private sectors. In particular, Singapore designers are poised to be part of the growth stories of sectors in:

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<sup>28</sup> McKinsey, “[Five ways that ESG creates value](#)”, 14 Nov 2019

<sup>29</sup> Bain & Co, “[Could Covid-19 open more doors for ESG investing?](#)”, 26 Aug 2020

<sup>30</sup> Raconteur, “[The true climate cost of going digital](#)”, 21 Oct 2020

<sup>31</sup> Gerry McGovern, “[“World Wide Waste” excerpt](#)”, Apr 2020

<sup>32</sup> UN, “[COVID-19: “We have an opportunity to design & implement more inclusive & accessible societies”](#)”, 7 May 2020



## **Push for new radical growth in:**

### Healthcare

Several interviewees agreed that Singapore's public system, specifically healthcare, has progressed to a very high standard of design and serves as an excellent example for the application of technology. The National University Health System's efforts in pushing to integrate AI into Singapore's healthcare system to help hospitals move towards proactive, predictive medicine is one such case. Our interviewees also highlighted the potential for design in improving existing services like managing appointments, finding test results, and dealing with prescriptions – *“it feels like we always have one leg in the future”*.

**With a strong foundation in public healthcare, Singapore is primed to turn to more granular challenges** such as probing into possible limiting factors such as tight doctor-patient ratios, or expanding to the private healthcare market. In particular, our interviewees noted that the *“family GP segment seemed to have fallen far behind the well-designed public system”* – there were many opportunities to designers to re-design processes, spaces and services that could lead to cost savings for both clinics and patients. Also, the security of healthcare is fortified when Singapore's employees inject a proportion of their salary into mandated savings for medical care insurance.

Singapore is also an attractive place to experiment with digital health solutions because of low barriers to adoption – a recent Health on Demand survey showed that most respondents were willing to try one or more of the many digital health innovations available on the market; in addition, 91% of Singaporeans were willing to share personal health data if they see a benefit, especially in improving medical care quality and receiving personalised health services.<sup>33</sup>

However, gaps persist – when asked to choose between more convenient online services and less convenient in-person services, most chose the latter, likely because access to quality healthcare providers is not an issue in the relatively small island. Respondents were also less interested in receiving virtual care or relying on AI for medical diagnosis, even though virtual visits are nearly 20% cheaper than physical ones.<sup>34</sup> Further, our interviewees also highlighted areas in our healthcare system – specifically private GP clinics – that are *“still operating the same way today as they did 20 years ago!”*, noting that these are areas where all designers of different skillsets and specialisations could step in to lead a rethink, not just healthcare-specialised designers.

Both advantages and limitations point to a wide scope of opportunities for Singapore design to step in with solutions, which can then be exported/ scaled globally. An interviewee pointed out that healthcare is an *“evergreen sector”*, i.e a sector that will always have users worldwide and thus tremendous opportunities for design.

### Environmental sustainability

Interviewees opined that **infrastructure and systems involving food sustainability, water and energy, and urban solutions have much scope for designers, especially if they can adopt a systems-based mindset.**

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<sup>33</sup> Laing Buisson, [“Covid-19 makes Singapore's digital health on-demand”](#), 9 Oct 2020

<sup>34</sup> Laing Buisson, [“Covid-19 makes Singapore's digital health on-demand”](#), 9 Oct 2020

Singapore's Smart Sustainable Cities initiative brings together solutions across industries to create green, digital and efficient urban spaces. Singapore is in a good position to realize this after having exported urban solutions in areas like built environment and city management, urban mobility, energy, safety and security and environment and water. Global MNCs have set up labs or innovation spaces in Singapore to tap on Singapore's capabilities as an urban living laboratory, and test smart city technologies that have potential to be exported to the region. 3M, for example, has invested US\$1 billion in a Smart Urban Solutions Lab to support rapid business growth in Southeast Asia, particularly in energy and smart infrastructure domains.<sup>35</sup> The Singapore Environment Council's Green Map is another example of investment injected into using smart tech to encourage eco-consciousness and sustainable behaviours.<sup>36</sup>

By embracing technological innovations like robotics, automation and machine analytics, an abundance of opportunities can be provided for designers focusing on industrial design, service design and systems design, especially in investigating eco-smart solutions.

#### Advanced manufacturing

Such opportunities are extended to include advanced manufacturing, which the **significant public investment** in the development of Jurong Innovation District (JID) clearly exemplifies. Having successfully attracted MNCs, SMEs and incubators, JID aims to host factories of the future and an advanced manufacturing campus that will allow businesses to gain access to networks of research and development that can help them accelerate the implementation of smart technologies.<sup>37</sup>

Especially in light of safe-distancing during Covid-19, it is noted that the Industry 4.0 has had more of a push through the Internet of Things, AI, robotics and additive manufacturing that are redefining the nature of manufacturing. Chairman of A\*STAR Lim Chuan Poh noted that "For ASEAN-based manufacturers to remain competitive, they need a clear strategy to ride the new age of Industry 4.0, where advanced manufacturing technologies such as robotics and the Industrial Internet of Things (IIoT) are transforming the global manufacturing sector."<sup>38</sup> Continuous upskilling is expected to remain a lasting feature in the industry, so designers can take advantage of it to expand the diversity of skill development.

#### **Incremental improvements required in:**

##### E-commerce

An interviewee noted that the e-commerce platforms in Singapore were "*very mediocre*", with poor UI/ UX and consumer mapping experiences. The driving impetus for e-commerce is also not as strong compared to, for eg. China and its widespread digital penetration.

Efforts to refresh retail via e-commerce have begun through the industry-led Alliance for Action (AfA) in Smart Commerce (arising from the Emerging Stronger Taskforce), which is looking into **blending of online and offline shopping experiences** – delivering personalised approach that shoppers want, while helping traditional retailers expand their reach ultimately even beyond Singapore. Successful delivery of such blended solutions also depends on strong

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<sup>35</sup> SEDB, "[Urban solutions and sustainability](#)", 2020

<sup>36</sup> SEC, "[Green goes digital](#)", 2020

<sup>37</sup> A\*STAR, "[Manufacturers Capitalise On Industry 4.0 To Boost Productivity](#)", Sep 2020

<sup>38</sup> A\*STAR, "[Manufacturers Capitalise On Industry 4.0 To Boost Productivity](#)", Sep 2020

partnerships between retailers and e-commerce platforms, for example, CapitaLand and Shopee's recent collaboration.<sup>39</sup>

With these developments, there is scope for design to play a role in improving user experience, creating new consumer journeys, incorporating smart tech like AI etc, to create and maintain conversions and support behaviour change.

### Logistics

Logistics was also highlighted as prime for massive transformation due to its tedious, cost-intensive and labour-intensive nature. Over the past decades, global supply chains have become very complex, multi-staged and dependent on access to low-cost labour. This precarious state leaves global logistics and supply chains vulnerable to black swan events like Covid-19, natural disasters and even geopolitical tensions like the US-China trade war.<sup>40</sup> However, our interviewees noted that prior to the pandemic, the sector would have been able to bank on cheap labour and thus might not have had the impetus to innovate.

This comes to a head with the significance of logistics to Singapore's economic interests – political leaders have noted that Singapore cannot afford to retreat from global markets.<sup>41</sup> Moreover, the logistics sector is a key pillar of Singapore's economy and contributed \$6.8 billion or 1.4 per cent of Singapore's gross domestic product in 2019. It employs over 86,000 workers across more than 5,300 enterprises. Most importantly, it is a critical enabler for major segments of the nation's economy, including manufacturing and wholesale trade, as it facilitates the domestic and international flow of goods.<sup>42</sup>

Coupled with the impact of the pandemic on supply chains, the impetus to innovate is stronger than ever. Government investment has started to pour into innovating the logistics sector, notably through digital transformation that focuses on improving the efficiency of its system and utilising the latest technologies possible. The Logistics Industry Digital Plan has been refreshed to offer new solutions in digital trade platforms, supply chain analytics, efficient energy management, distributed ledger technology in transportation, and Augmented Reality (AR) / Virtual Reality (VR) for training and operation. In other words, **there is scope for more tech solutions to be integrated through design**, to create efficiency in systems, better customer-centricity and perhaps even in providing training solutions for the upskilling of logistics workers.<sup>43</sup>

Beyond these sectors, Singapore's competitive strength lies in its small size coupled with strong governance. This provides the perfect context for test-bedding and solutioning, and the skillsets and experiences of designers are a winning combination for Singapore to lead in the digital transformation of sectors such as healthcare, retail, logistics and lifestyle, sustainable urban solutions.

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<sup>39</sup> Straits Times, "[How 7 industry-led coalition groups are preparing for Singapore's post-Covid economy](#)", 19 Nov 2020

<sup>40</sup> <https://sloanreview.mit.edu/article/three-scenarios-to-guide-your-global-supply-chain-recovery/>  
<https://sloanreview.mit.edu/article/is-it-time-to-rethink-globalized-supply-chains/>

<sup>41</sup> <https://www.straitstimes.com/business/economy/surviving-supply-chain-shocks-caused-by-covid-19-pandemic>

<sup>42</sup> Straits Times, "[Singapore has strengthened status as global logistics hub amid Covid-19 crisis: Chan Chun Sing](#)", 27 Oct 2020

<sup>43</sup> IMDA, "[Logistics Sector Gets Added Boost to Support Digital Transformation Efforts in The Changing Business Environment](#)", 17 August 2020

*“If it could work in Singapore, it could work in any mega-city.”* An interviewee noted that **Singapore’s small size and strong governance would be very attractive to stakeholders looking to develop or testbed solutions.** Singapore’s soft and hard infrastructure available to design ecosystems around specific issues such as food sustainability, water and energy distinguishes it. A relevant case study would be the upcoming Tengah town, which would have its own cooling system and fleet of electric vehicles. An additional competitive advantage could be Singapore’s strong culture of trust in governance and institutions – for example, 61% of Singapore consumers think the government should be the main driver for digital healthcare solutions, compared to only 39% globally.<sup>44</sup>

## DESIGNING IN A DIGITAL WORLD: PERSPECTIVES AND SKILLS

*[TLDR] “Design is a strategy for businesses to make better choices,”* commented Richa Menke, Director of Strategic Design at BCG Digital Ventures. **Interviewees noted that the “nature of asks” of designers had become more sophisticated – moving away from one-off requests, and increasingly framed as problem statements that relate to business outcomes or changes. Clients expect solutions to be “systems of interventions” for success. The “skills” required of designers are presented as 3 forms: perspectives (how we sense-make the world), design skills and tech skills – but even the latter two are more about problem-solving skills than technical skills.**

1. **Perspectives: How designers seek to understand the world and the lenses by which to approach issues and problem-solving**
  - i. Understanding complexity; seeing the interconnectedness of problems and systems

Interviewees highly recommended that we groom talent for different facets of design, and designers in Singapore must develop breadth in their skills and thinking. For example, Johnson Controls has invested S\$50million to establish OpenBlue, an innovation lab with the NUS School of Design and the Environment to develop and test digital technology for smart monitoring, and to understand how environments affect people – through this, they had to consider how different design domains (services, product, interior, furniture, etc.) interact with such technology.<sup>45</sup> In another example, an interviewee shared several hiring experiences in Singapore where it had been a challenge to find local candidates who meet requirements of a senior designer in terms of technical skills, as well as having the breadth to manage teams, look after products and clients as well as the depth to handle transformation projects.

Other interviewees suggested that a key part of the puzzle is in ecosystem management and design. In an ongoing exploration of how design is responding to Covid-19, Gensler has put together a diverse and surprising collection of research on how design could impact huge macro issues (climate change, healthcare systems, community trust and resilience) to the micro ones (post-pandemic wayfinding, touchless tech, new air filtration systems).<sup>46</sup> The takeaway is clear – **ecosystem thinking, and the awareness around interfacing with both**

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<sup>44</sup> Laing Buisson, [“Covid-19 makes Singapore’s digital health on-demand”](#), 9 Oct 2020

<sup>45</sup> NUS News, [“New innovation centre to boost smart campus initiative”](#), 17 Sep 2020

<sup>46</sup> Gensler, [Design responds to a changing world](#). Accessed 31 Dec 2020

**macro and micro, are important skills for designers.** An interviewee noted that systems design was how Singapore could win despite finite resources, and was particularly prime for such work to thrive due to its multicultural make-up, lack of historical baggage, and ability to adapt. He opined that through systems and organisational design, even a small team that brings together brilliant people from different disciplines could make a massive impact.

- ii. Understand human dynamics in social systems and businesses

Our interviewees also proposed that **designers’ breadth of capabilities today must include the ability to conduct research and identify patterns, understand the psychology of change, and locate opportunities** – “*This isn’t a nice to have, it’s the difference between success and failure.*”, noted Menke. This is echoed by findings from Bill Gross, serial entrepreneur and founder of Idealab – in researching why some startups fail and some succeed, he found that while there is an array of factors like funding, team, differentiated proposition, the most important factor is always timing. Timing, he explained, encompasses factors like feasibility, improvement of tech, desirability of a proposition, and ultimately “capturing a shift in value”.<sup>47</sup> Therefore, the ability to connect dots, see what is valuable, and understand shifts in desirability would be a very strategic role for design to play.

Another key capability that was raised by Menke was business fundamentals and acumen – “*business understanding is what would make designers unstoppable i.e understanding desirability, feasibility and viability*”. An interviewee opined that a more holistic education will be needed, as designers would no longer work on their own but be expected to interface with other functions and embrace technology. In hiring for strategic design, the interviewee shared that they were not looking for a singular profile, but a diversity. Menke added, “*Design is fundamentally about reimagining, rather than dealing with the language of constraints.*”

- iii. Be aware of how designs and solutions impact DEI and ESG

Even during pre-pandemic times, design has been gaining traction in bringing focus to DEI/ESG issues, being inherently human-centered and empathy-driven. Donald Fan, senior director for Walmart’s global office of culture, diversity and inclusion, wrote about how the company embraced design thinking to transform the company’s DEI framework from being reactive and compliance-driven, to proactive and genuinely people-focused. This does not only involve having empathy, but also designing processes for continuous feedback loops to have a timely pulse, chart the progress and course correct as needed.<sup>48</sup> To design effectively for the workplace and employers of tomorrow, such thinking must become part of the vocabulary of designers.

- iv. Think at Global Scale (think K-pop!)

Our interviewees noted that **an urgent limitation of Singapore designers was thinking and aiming global.** An interviewee with a background in computer science also noted that the digital functioned fundamentally on an exponential scale, racking up numbers in the billions, which could be challenging for the layman to comprehend. “*The best people need just five*

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<sup>47</sup> Bill Gross, TED2015, “[The single biggest reason why startups succeed](#)”, Mar 2015

<sup>48</sup> Chief Learning Officer, Donald Fan, “Embrace design thinking to advance diversity, equity and inclusion”, 30 Dec 2019

*lines of code, when others need 50. It's asking yourself - how can this one thing be executed one billion times?"*

Several interviewees proposed that this limitation could be a result of a lack of exposure in Singapore, observing that mindsets and culture could be quite formulaic - *"You've already been pegged, and for the next 40-50 years of your life you have to grind it out."* Singapore designers also had the tendency to design for experiences and contexts they were directly familiar with. One suggestion was increased regional exposure – Singapore designers could benefit from the region's strengths of adaptability and innovation; and also, could succeed with their language abilities, skills in analysis and technical capabilities, as well as experience in designing for healthcare, education and public sector. We've seen some inspiring examples of Singapore designers venturing overseas, with companies like Aleph growing beyond local shores to seven countries, and expanding their M&A strategy to expand their regional footprint whilst maintaining their core corporate identity.

Menke also noted that this prevalence of remote work and decentralised operations would transform the concept of competition for designers - while one will be able to work for anyone in the world, they would also inevitably compete with talent from the world over. Are we prepared?

## 2. Design Skills

- i. Designing for blended worlds: digital and physical must interact from the get-go

Today's projects are fundamentally multi-dimensional: one of our interviewees shared that while designing a digital product for an airport, he would be expected to understand firstly how users would interact and behave in the physical space (psychology of users) and integrate that into the digital experience. He must first understand airport operations, behavioural change, architecture even before he set about digital design.

One remarkable example of designing across physical and digital is Taiwanese civic hacker and Digital Minister Audrey Tang. Using design, digital expertise and deep cultural understanding, Tang's team successfully rolled out apps to update on mask stocks, counter misinformation, crowdsource solutions, and more. The apps have more than 10 million users, and have helped foster trust amongst citizens and between government and citizen. To date, there have been only 7 deaths, and most facets of life have been able to resume, which can be partly attributed to the successful use of digital design.<sup>49</sup>

- ii. Integrating different design domains; influencing people.

All interviewees unanimously raised that **designers have to be able to connect various domains of design, and deliver solutions driven by integrative thinking**. As the issues and challenges of the day are increasingly complex, an interviewee shared a view that *"no one company or party can go it alone"*. The designer's role was to connect the dots, function as active listeners and facilitators, and work across stakeholders. An interviewee suggested that local design firms were simply too small to build the multidisciplinary teams, and therefore would better suit a consortium model that combines designers with complementary strengths.

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<sup>49</sup> NPR, "Digital Minister on Taiwan's Handling Of The Coronavirus Pandemic", 12 Oct 2020

Interviewees opined that the “hygiene skillset” are soft skills such as managing egos, interests and conflicts; adaptability; and foresight, to be a few steps ahead of clients in terms of understanding options and trends. The LinkedIn Learning 2020 Workplace Learning Report identified top critical soft skills as: persuasiveness, collaboration, adaptability and emotional intelligence.<sup>50</sup> (This research was done pre-pandemic, so it would also be interesting to see the 2021 report.)

Staying up-to-date on current affairs and trending topics amidst a fast-paced and complex world has also become essential. An interviewee shared a recent course he had taken which covered topics such as shifting power circles, social complexity, discomfort and conflict, social care, and shifts in urban spaces. He opined that these areas translated well particularly into the digital. *“It’s easier for a person like this to go into digital, than for a digital person to come into this space”*.

### iii. Storytelling and the conceptualisation of user experience

Interviewees mentioned that **story-telling skills are paramount to design**. This comes on the heels of an existential challenge for designers, brought about by commodisation of visual/graphic through highly accessible drag-and-drop online tools for graphic and web design (like Canva), or platforms offering very cheap traditional design services (like 5iver). Furthermore, AI-based automated design engines like [Leia A.I.](#) can generate entire layouts based solely on the content given, and run A/B testing.<sup>51</sup> Taking this even further are transformer language models like DALL-E, a brainchild of OpenAI released in 2020, which can create good quality, almost ready-to-use images using only text clusters and keywords.<sup>52</sup>

Digital design must therefore evolve beyond form and function. One key value proposition is story-telling, “used in design as a technique to get insight into users, build empathy and access them emotionally” – in order words, creating stronger emotional connections between design and user.<sup>53</sup> One interviewee noted that, in the new tier of digital design capabilities, the highest value and most money lies in designers’ ability to conceptualise the user experience and translate this concept into the right business model. Next in value are those hired to execute concepts, and the lowest are those hired to “push pixels”. These designers have highly advanced technical skills, but in the fast-paced, narrative-driven world, tend to become “digital farmers” if they cannot eventually upskill towards thinking about holistic user experiences.

## 3. Tech Skills

The LinkedIn Workplace Learning Report has highlighted digital capabilities in its top ten critical hard skills: Blockchain, cloud computing, AI, UX design, scientific computing and video production, noting that these centered around analytical and data-driven capabilities.<sup>54</sup> Our interviewees suggested that some areas with good applications for design are: extended reality techniques (XR, VR and AR), and artificial intelligence (AI) technologies such as machine learning and computational techniques. In AI, designers could play a role in the creation of the blueprint of how the algorithm is created. AI, *“from a technical standpoint is*

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<sup>50</sup> Forbes, [“Skill Gap 2020: 5 Soft Skills And 10 Hard Skills Companies Need Now”](#), 17 Apr 2020

<sup>51</sup> Jason Amunwa, [“Why designers must learn copywriting to keep their jobs”](#), accessed 31 Dec 2020

<sup>52</sup> Towards Data Science, [“Have you seen this AI Avocado Chair?”](#), 10 Jan 2021

<sup>53</sup> Interaction Design Foundation, [“What is Storytelling”](#), accessed 31 Dec 2020

<sup>54</sup> LinkedIn, [LinkedIn Learning 2020 Workplace Learning Report](#), 2020

*very developed, but not from a design standpoint.*” In another example, The Mandalorian by Disney+, had used ground-breaking virtual production platforms where filmmakers generated digital backdrops in real-time, without needing to leave the studio. With a company like Razer in the local ecosystem, an interviewee opined that this area of technology would be “*spot on*” for Singaporean designers to develop a niche in.

However, there are also platforms available where designers with limited experience with tech could prototype and ‘hack’ together solutions, potentially building communities of practice. For example, ‘low-code’ platforms allowed users to drag-and-drop elements, and micro-gig platforms such as Mechanical Turk by Amazon provided the potential for large-scale testing and validation.

Tech skills are known to have a shelf-life of five years in today’s climate. **Hence shaping attitudes towards embracing new technology in general will be more important and sustainable.**<sup>55</sup> An interviewee shared that in education, particularly during the pandemic, “*educators embraced any or any technology and put an educational use to it*”. He opined that designers should have the same versatility and openness to embrace the “zeitgeist of today”, be it AI, automation, or IoT as they become mainstream.

In terms of seeking education or professional development, another interviewee shared that as a primarily digital designer with no industrial experience, he had found that he lacked the ability to prototype, and understand materials, substances and shapes. On the other hand, industrial designers lacked digital understanding and mindset. To address this, several interviewees proposed that what we seek out as design education has to fundamentally “reset” to move away from designing for screens, to encompass both understanding the physical world and the digital. The structured environment of school could be ideal for understanding principles and philosophies, and skills such as problem-solving and building a community conversation, while craft could be developed in the workplace.

Finally, in building teams, designers should anticipate skills needed for the future, and be open-minded to integrate and build them into their teams early even if the need is not in the immediate present. “*It may incur high costs in the short term, but guarantees survival in the long term.*”

## WHAT’S NEXT?

Dsg is moving forward to develop our research into opportunities in the intersection of design x digital, given that this is a large, fast-moving topic. We have landed on four key questions that we will try to answer over the next few months:

1. What are the key capabilities in our local design community with regards to digital?
2. In which areas should we build up our Singapore designers' right to play? (i.e what spaces can we play confidently in)
3. Where are our existing ecosystems, held by government, private sector, education and the design community?

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<sup>55</sup> LinkedIn, [LinkedIn Learning 2020 Workplace Learning Report](#), 2020



#### 4. How should we plug design into digital?

Over the next few months, concrete next steps in answering these four questions include:

##### 1. Getting more data points from the design industry:

We intend to continue widening our sensing mechanisms through, particularly in answering the question about existing key capabilities and bench strength. Dsg will be putting out periodic industry surveys (the first was done in June, on the impact of Covid-19 on design businesses), as well as starting a series of Industry Conversations centered around these questions. Do join us for these feedback sessions!

##### 2. Triangulating the insights with design x digital users:

To better understand where design can play, and to unveil existing ecosystems that may be opaque to us, Dsg will speak to the sectors forecasted as important users of design and digital. If you know of someone we should be speaking to, get in touch to let us know.

If you have any thoughts or input to this report, do get in touch with our research team at [research@designsingapore.org](mailto:research@designsingapore.org).

Thank you for reading and we look forward to hearing from you!

Strategic Futures Team, DesignSingapore Council

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