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Pathways to green personalisation: Reducing consumption through design

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ABSTRACT

Humanity has reached the point where current consumer lifestyles are not sustainable, and this status quo must be disrupted if we are to slow down climate change. Personalisation is a technique which, amongst other purposes, uses machine learning algorithms and personal data harvesting to prompt people to engage in various financial and social activities that often encourage us to consume more. It creates wealth for businesses and brings satisfaction to customers. We rely on personalised messaging and allow Artificial Intelligence (AI) select information for our personal newsfeeds, contributing to the overall personalisation economy. Personalisation is most often deliberately designed to promote consumption, but that purpose is not preordained. Designers could repurpose personalisation processes to promote 'greener' consumption choices or even to reduce consumption all together. This concept paper coins a new term 'green personalisation'[1] and discusses pathways to inform new approaches to reduce consumption and the resulting environmental harm.

1. Personalisation in a market economy

Personalisation is essentially concerned with individual rather than community life. It is an emancipatory response to the standardisation resulting from the industrial revolution and, particularly in western culture, is understood to be a central route to a good life. Personalisation finds its origins in consumer culture and, historically, is tied to the rise of the 'individual' in Europe in the sixteenth century. Both Humanism and Protestantism emphasised personal

faith and belief, creating the foundations for personalisation as a concept. A later, and clearly distinct, influence came from the Romantic Movement, which brought to prominence aesthetic appreciation, emotional individualism, creativity and self-expression, and an alternative view of nature and its preservation (Michaelis 2000). This contributed to a more idealistic view of personalisation as something everyone should strive to achieve. Both positions were used to justify consumption across all social classes and the distinctiveness of personal possessions. Reinforcing these developments, the emergence of digital technologies and machine learning algorithms subsequently enabled a new era of data-driven consumerism which has significantly amplified trends in consumption that have evolved over the last three hundred years.

In the context of this conceptual paper, personalisation is looked at from a design perspective taking it out of a somewhat narrow mass-customisation framework. Kuksa, Fisher, and Kent (2022) provides a comprehensive analysis of the term's definitions across disciplines and sectors, concluding that in the age of digital communication and widespread throwaway consumerism it is appropriate to define personalisation as the commercial expression of individualism, in which every person can be turned into a consumer via data and AI. As argued by Kuksa and Fisher (2017), personalisation is purposefully designed to influence consumer choices and is a key contributor to driving consumption. Indirect consequences of the current applications of personalisation are the destruction of our environment through increased consumption of resources. Furthermore, the upsurge in scale and concentration of ownership of industries providing and exploiting personalisation has resulted in extreme inequalities across our society. Many citizens are beginning to recognise the collective damage caused by overconsumption, but as individual consumers find it difficult to resist the lure of personalisation and, as a result, consume more. In response to overconsumption and resource utilisation, a large body of research has emerged on the circular economy, waste management, and product lifecycles (e.g. Charter 2018). There are also a number of cross-border, industry-led initiatives in this area, including, for example, the global re-use platform Loop and the pre-owned clothes service by Zara. These recent developments are of great importance to a more resource-efficient approach to producing goods, but they only slightly reduce the volume of manufacturing (Cooper and Gutowski 2015) or may even unintentionally increase it (Polimeni et al. 2008).

Overconsumption is facilitated by the market economy, in which the production, prices and consumption of goods and services are determined by the balance of supply and demand. In a simplified model, firms compete by designing and supplying products and services to fulfil the demand of consumers, creating a very efficient system for satisfying their needs and wants (Dholakia and First 2003). A successful firm will grow its revenue and

profitability by winning and retaining customers, while less successful businesses will experience decline in sales and profits and ultimately, fail. For example, Apple designed the iPhone which many consumers preferred to the Blackberry phone and as a result Apple grew and hired more employees to ensure that the iPhone continued to be preferred, whereas Blackberry was unable to redesign their device and let go most of its staff (Moazed and Johnson 2016). In this economic system, designers play an essential role by not only creating new products and services that consumers want, but also by facilitating the internal organisational processes used in their production. As employees, designers' income derives from someone else's consumption, therefore, their job is ultimately to increase it. The market economy is effective at generating desirable products and services and consumers cannot stop buying them. Even as we recognise the problem conceptually, as individual consumers we continue to drive overconsumption.

There are rising calls, however, to move away from growth-focused economics in the Global North, to address threats posed by climate change, biodiversity loss and social disruption. Since resources on our planet are limited, dependency on continued growth in the consumption of resource-consuming products is unsustainable (Jackson 2017). Post-growth economic models (e.g. Raworth's Doughnut Economy and UNEP Integrated Green Economy Modelling) call for the need to set up planetary boundaries to achieve inclusive wealth and social and economic wellbeing (Dasgupta 2021). Broad adoption of post-growth economic models is dependent on 'a strategic effort to understand both the source of growth dependencies in different sectors of the economy and instruments that can be used to overcome that dependency' (Jackson 2022).

As Cooper (2020) points out, we need much bigger transformations in education and economic management to move away from current pervasive throwaway culture. The market economy is facilitated by digital personalisation and there is an urgent need to dissect this phenomenon to understand the technological and social structures that enable it to drive unsustainable consumption. Designers have an obligation to explore ways to redirect the machine of personalisation, so it also prioritises society and the environment over just individuals and businesses.

2. Understanding the personalisation machine

Increases in the volume, velocity and variety of personal data and advances in marketing communications, primarily through social media and AI, have drastically increased businesses' ability to target and engage with individual customers. Personalisation is particularly relevant where data from a variety of sources can be applied to new marketing opportunities. Uber and other ride sharing applications, for example, overlay digital ride booking, car

tracking, and pricing information to better estimate demand, create dynamic pricing models, and optimise business opportunities. Uber Eats was an obvious adjacent brand extension to the Uber platform. When customers are not traveling, Uber can still serve them and earn additional revenue by delivering food to their home or office. Uber Eats also enables Uber to learn more about each individual customer, not only where they travel to, but also where they eat, collecting additional data on the restaurants and other hospitality services. This information would have previously been unavailable when the transaction occurred outside Uber's ecosystem (Schweidel et al. 2022). The success of Uber, Amazon, Google and other Big Tech companies illustrates how through increasing interactions with each of us, they know more about our personal preferences and are able to customise their platforms more precisely to suit our needs. As argued by Bardakci and Whitelock (2003), the ultimate end of ever-finer differentiation of the market is to create markets of one, a definition applied by some marketers to personalisation itself (Vesanen and Raulas 2006) in which micro-marketing at the individual level is the ultimate goal.

There are three key information technologies that underpin commercial personalisation. First, the technologies surrounding customer data and its acquisition, the raw material on which the personalisation machine operates. The more accurate and specific data a business has access to, the more effective their personalisation. Data include information on individuals who will be targeted, and on populations whose general behaviour can be used to statistically predict the behaviour of individuals in the population. Second, machine learning algorithms that process the data to identify patterns of behaviour and make predictions or recommendations. In particular, a new class of such algorithms which are often referred to as AI, have shown to be surprisingly effective. For sufficiently large data sets, AI is able to detect patterns and make recommendations better than a human being, and they can do this at scale so that results can be applied to millions of individual customers simultaneously. Finally, generative AI analyses data to create new written, graphic, or video outputs based on that data (Foster 2022). These technologies have significantly extended the range and effectiveness of the marketing dimension of the personalisation machine. They enable businesses to not only forecast what a customer is likely to buy, but to create targeted digital advertising and communications in real time that increase the probability that the customer will buy, and if they don't buy, to prompt them with the next best offer (Kshetri et al. 2023). Moreover, AI is now able to track our emotional state through affective computing and the application of machine-learning to social sensing and sentiment analysis (Yonck 2020). In this way, AI can reach even deeper into the minds of each consumer, personalise the stimulus more

precisely and irresistibly, and guide each person more reliably towards the desired behaviour—which is generally consumption.

The growth in online sales demonstrates the success of these technologies, which combined with highly efficient production and distribution systems, hold an extraordinary potential to stimulate future consumption. At present, 27% of the world's population (8 billion) buy items online, representing an increase of 40% over the past 5 years (Tidio 2022). In 2023, Amazon's online platform alone sold approximately $500 billion worth of goods globally and the combined sales of online software platforms, Google, Facebook and TikTok, returned approximately $413 billion of profit (Statista 2024).

3. The problem with digital personalisation

The immateriality of the digital age has increased the visibility, symbolism and meaning of consumer brands, and their accessibility to consumers. Digital connectivity and its global spread enable them to move from passive submission of their data, a one-way process controlled by the brand, to actively engaging in the process of personalising and co-design. But hyper-contextualisation also places consumers in the state of hypernudge, which as legal scholar Karen Yeung notes, operates at every moment in time and space to drive unsustainable purchasing behaviour and waste generation. The tragedy is that as consumers are prompted to engage with brands through their digital marketing, it often leads to them becoming unwitting participants in excessive consumption and frequently, a lack of awareness of the environmental harm that this causes. This is because personalisation employs mechanisms that although at present poorly understood, are designed to exploit individual choice behaviour. There is a need to disrupt the status quo by placing the concept of 'society as a consumer' (Kuksa, Fisher, and Kent 2022) at the heart of an effort to repurpose personalisation for the benefit of society.

There are two key design questions that must be answered as a matter of urgency, by those engaged in designing and enabling personalisation and who wish to change its purpose. The first concerns the mechanism of designing interactions to redirect existing targeting and personalisation processes from boosting unsustainable consumption to reducing it. The second focuses on the social context and how we use design to channel social influence to become a motivational force that will drive the personalisation process towards reduced consumption. Addressing these urgent questions will help us to devise pathways to use design in partnership with education and regulation for channelling social influence towards changing specific consumption behaviours in a market economy.

Finding solutions to slow down consumption is extremely challenging given the requirements of a market economy and our seemingly natural human bias towards individual acquisition and consumption. Designers are paid to create desirable goods and services, or make existing ones more appealing, to increase the sales of producers. Driving consumption is part of designers' job description. But, as we have learned from health interventions ranging from seatbelts, anti-smoking campaigns to our collective acceptance of some personal constraints during the COVID-19 pandemic, it is possible for us to prioritise collective welfare over individual choices, and that in time, these regulated and designed behaviours become, for many of us, our preference. Following this most recent crisis, we are presented with an opportunity to re-purpose the digital world, towards our collective benefit and not just individual expression or corporate profit.

Previous research has provided a robust conceptual framing of personalisation and charted its origins and manifestations. The next critical steps are to investigate the mechanics of its commercial application, the interplay between personalisation, cultural norms and the resulting impact of overconsumption, and then to find ways to bridge the aspirations of many designers coming out of design schools to have a positive impact on the world and the economic needs of businesses to earn a living in a market economy.

4. Pathways to green personalisation

4.1. Fashion industry as a case study

An examination of how personalisation is used in the marketing and sales process reveals opportunities for a transition away from the 'red commercialisation' of overconsumption, to the 'green personalisation' of more considered practices of consuming. Fashion is a prominent example of both the application of personalisation processes leading to overconsumption, and of the use of social influence as a motive force to drive the process.

Definitions of 'fashion' illustrate the phenomenon of personalisation. According to the Merriam-Webster dictionary, 'fashion' means 'a practice or interest that is very popular for a short time'—a definition that can embrace trends and describe rituals and shapes. Fashion clothing too can be defined from different perspectives, as a form of material culture related to bodily decoration, a kind of signifying language, but importantly as a system of organisations that create, communicate and distribute to consumers that pervades the entire consumption system (Crane 2012). The social effects of fashion can be seen in the ways in which social and personal identity, of belonging and difference, are expressed and shaped. Social identity is evident when many people behave in the same way that becomes 'the fashion' or norm for the group. But fashion is inherently personal; it is sized to fit an

individual personally and its 'look' or style becomes part of one's identity. Our clothes, glasses, and jewellery are the closest possessions to our body (Mittal 2006) and mediate how others see us physically. They are also prime examples of goods sold through personalised promotions.

Currently, fashion is a major contributor to greenhouse gas emissions and the accumulation of waste in unwanted goods (Niinimäki et al. 2020). Items of clothing may be unwanted because they no longer fulfil their utilitarian function—they are worn out or broken—or more often, because they stopped fulfilling their emotional function—they are no longer fashionable. Fashion is a particularly insidious type of consumption because it is often driven by the latest trends and styles, which are currently most admired by consumers. This sets a clock running on the lifetime of any item of fashion. After some time, it is no longer the 'latest' and as a result, no longer 'admired' and then often discarded by those who wish to look fashionable. Fashion producers are motivated to introduce and promote new looks and collections at short intervals to show that the previous style is out of date and encourage the purchase of the next iteration (Marx 2022).

There are different pathways to green personalisation through 'fashion'. Fashion clothing, can itself be greener if it has used less resources in its production and distribution. The consumption of fashion can be greener if we consume less of it to reduce production. Understanding preferences can reduce overstocking by more accurately predicting what consumers want. The longevity of existing garments can be extended by creative repair and upcycling, giving existing clothes a different fashionable 'look'. We can be encouraged to consume less if other values are overlayed on fashion, such as being ethical, not profligate, and being greener. This might lead us to not change our jeans today but wait until next year, or to prefer a second-hand item of clothing rather than a new one. In time, the way we buy clothes can evolve to a new fashion or norm of less frequent purchase, a smaller wardrobe, and less environmentally damaging garments.

How might a green personalisation campaign be executed to achieve the above? First, we need to promote ethics, frugality, and environmental knowledge to channel social influence as a motive force to drive the process towards reduced consumption. This must recognise different consumer demographics; for example, that Gen-Z's attitudes and beliefs are distinct from older age groups. Likewise, these groups respond to different communication content and mixes of social media, product placement, advertorials and advertisements, endorsements, in-store displays and promotions. Second, as shoppers are considering different items of clothing in-store and online at the purchasing stage of their journey, we need to bring to their attention the attributes for each item to encourage them to make greener choices. This is the realm of commercial personalisation. Each of these

mechanisms is essentially the same as the current process for promoting the consumption of fashion, but with a different purpose—less not more, enduring fashion rather than fast ones. Narratives, which have become a core part of branding, are central to this process and changing them would contribute to the projection of new meanings of 'green' such as 'fashionable' or 'timeless' like 'Chanel'.

An example of a fashion brand that is positioned as sustainable and uses contemporary promotion and sales processes is Reformation and its 'Getting Stuff Done' communications campaign. This campaign was created to both inspire and educate customers and thereby influence sustainable lifestyle choices. Reformation manufactures sustainably-made, limited editions (thereby reducing wastage) of womenswear. Their campaign featured influential individuals from different regions of the world who are committed to sustainable actions in their life, work and activism. Their profiles appeared in Reformation's website and social media channels. Each individual provided details about the work they do to effect change in both video and written interviews. The aim of the campaign was to showcase the brand's values by aligning with likeminded individuals 'getting stuff done' in the areas of sustainability, the environment and climate justice. Through online quarterly sustainability reports, Reformation stakeholders can monitor its progress under the headings of people, product, planet, and progress (Reformation 2023). The success of this clothing company demonstrates that embracing sustainability dimensions as part of the brand and product design is a viable business model. However, brand promotion, product design and personalised sales processes are not cheap and Reformation's business model targets higher-end shoppers in trendy, high-rent, fashionable districts who are willing to pay $150 for a pair of jeans. By contrast, at Walmart, the largest fashion retailer in the US, consumers can buy jeans for between $10 and $50. This means that for most consumers in the US, their budget would not stretch to a Reformation wardrobe. As Christophers (2024) argues with respect to green energy, not only must the margin to producers be high enough to support a viable business but the price to consumers be low enough for them to afford it.

High margins are required on all luxury and designer-led fashion brands, from Reformation to Gucci. Their difference is evident in the design, material but, primarily, in visual quality of their clothing and the people who model them. Mass-market retailers, such as Walmart and fast fashion brands such as Zara and H&M interpret the styles promoted by leading fashion houses to produce visually similar clothing at much lower cost, distributed through a large-scale and highly efficient supply chain, sold at much lower unit margins, and at a fraction of the price to meet the needs of most consumers.

A green personalisation campaign to slow consumption at affordable cost to the consumer has a good fit with the growing second-hand clothing and repair industry in the US and Western Europe (Persson and Hinton 2023). The garment reuse agenda is endorsed both formally—through second-hand clothing brands such as Revolve or Thredup, resale services offered by large clothing companies such as Patagonia Worn Wear and The North Face Renewed, and informally—through children's hand-me-down clothing shared within families and friends' groups. Fashion consumers display different motivations towards the purchasing of sustainable clothing according to their culture and the influence of their social connections. Such motivations include individual consumer knowledge of, and concern about, sustainability, and traditional apparel shopping attributes, specifically fashion consciousness, price sensitivity and, product quality. In addition, status and cultural norms may determine attitudes to sustainability in some societies. Second-hand clothing is not easily accepted by some consumers due to its connotations with poverty. Creative solutions to increase acceptance are required to present second-hand buying as a popular trend practiced by many, including celebrities and influential bloggers (Borusiak et al. 2020).

The second-hand clothing industry remains small compared to the new clothing industry. Most clothing that is sold *is* new, because consumer interest is partly driven by attachment to 'the new', but also by the mechanisms that promote the values of fashionable brands in our culture. These mechanisms are better funded, organised and communicated than the greener alternatives, creating a greater potential for financial rewards in new rather than second-hand clothing (Marn and Rosiello 1992). The high margin between the cost of the garment and its sales price pays the salaries of the staff in the firm, but also the profit that is left to the investors in the company. Profit motivates companies, just as salary and bonuses motivate employees.

The challenge for green personalisation is to extend the less obvious attributes of clothing including material choices, waste minimisation, and fair treatment of the workforce into the fashion. It is not easy to recognise these attributes by just looking at the clothing, so green personalisation in fashion is not only a complex communication problem, but also a behavioural, cognitive, and emotional one. As the data from Status Labs (2018) shows, typically 90% of users have not decided on the particular product brand they want to buy when embarking on an online purchasing journey and spend time in a pre-purchasing stage with different products in different online shopping carts. During this time, there is an opportunity for a green personalisation process to bring to the shopper's attention the attributes of the greener options. Similarly, SaleCycle (2023) indicates that around 81% of all online shopping carts are abandoned, at least for some time, and companies often use re-targeting approaches to encourage consumers to complete their

orders. This creates abundant opportunities for 'green' businesses to use per-sonalisation mechanisms to sway new consumers their way. While consumers are in this liminal state, there is an opportunity to inject a green personalisa-tion mechanism to redirect potential buyers to more sustainable product alternatives or even cancel or reverse their purchase altogether.

As physical spaces merge with online, personalised offers in a hybrid world of connectivity and branded touchpoints can prompt consumers to make more sustainable shopping choices. Moreover, connectivity throughout the customer shopping journey can promote and reinforce sustainable pur-chasing behaviour through consistent communications and product offers. To successfully repurpose the 'personalisation machine' for societal good, however, we need to have both a deep understanding of how personalisa-tion works and also of other important business practices that make a fash-ion business successful, including product design, production, supply chain management, and distribution that are needed to be able to deliver prod-ucts at a price most people can afford and with a margin to support the business itself. Designers can play important roles throughout this process and repurpose the full repertoire of tools for running a successful fashion business to encourage greener consumer choices.

4.2. Learning from past failures and successes

In 2007, Sir Terry Leahy, Tesco's CEO at the time, announced a pioneering carbon labelling initiative in collaboration with the UK Carbon Trust. The aspiration was to tag 50,000 Tesco own-brand products with information about their environmental impact. Sadly, this scheme was terminated in 2012, with only 500 products (1% of the initial target) labelled. Tesco's rea-sons for stopping the initiative were the complexity of estimating the carbon footprint of an individual product, as well as the slow uptake by other retailers. Academic studies (e.g. Boardman 2008), however, revealed limited consumer engagement, due to a combination of being unaware of the label-ling scheme and the scheme's complexity and information overload. In recent years, there have been several environmental projects at local, national, and international levels aiming to change consumption—which dis-appeared without a trace or, like The Body Shop, have gradually declined into insignificance. Crucially, there is no systematic research that would allow us to learn from these failures.

Project failure must be understood and theorised (Lindahl and Rehn 2007) if we wish to make a positive impact on businesses and society at large. Costello and Kingston (2020) point out that systemic transformation requires deep shifts across multiple domains, including micro-behaviours, mindsets, flows of resources and networks of collaborations. To achieve change, there

is a need to produce a systematic review and analysis of the past project fail-ures. But we should also look at examples of success from outside green ini-tiatives and learn from them equally. During the COVID-19 pandemic, new ways of producing content (especially digital) were developed, as the tech sector was forced to identify new ways of reaching audiences and filtering out misinformation. This demonstrates an existing capacity for rapid, large-scale change. And in the 4 years since 2019 countless new brands, new products, new behaviours have been launched and scaled to household names and typical lifestyles. To achieve change, we should avoid past failures in promoting greenness like the Tesco experiment and build on current com-mercial successes in the green space like Reformation and other more con-ventional commercial products such as an American shapewear and the clothing brand SKIMS.

A starting point is to recognise what is the same and what is different about promoting green choices compared to what is today considered a typ-ical consumer choice. Park et al.'s (2019) work on the level of complexity and confusion among consumers about sustainable purchasing behaviour dem-onstrates the need to learn from earlier initiatives. The fashion sector is a prolific adopter of digital technologies and communication techniques, but there is a general lack of awareness of sustainability issues in the industry. Many consumers are unaware of the negative effects of fast fashion con-sumption and the impact of excessive consumption is often seen as far removed from shopping for clothes (Diddi et al. 2019). Furthermore, some consumers associate sustainability with only environmental issues, while neglecting other important social and economic facets (Colasante and D'Adamo 2021). By contrast, Blazquez et al. (2020) found ethical fashion was a more appealing framing to consumers than environmental or eco-fashion. In other cases, very narrow definitions of sustainability, such as energy con-sumption and recycling are thought to be not directly relevant to the pur-chase of clothing (Munir 2020). The definitional problems around sustainability, its complexity and instability—as more aspects are uncovered, integrated and mediated—mean that more sophisticated educational and promotional initiatives are needed.

Starting at the highest levels, government and industry bodies have a role to play in personalising green content and promoting social consumption. To prevent sustainability bias, Colasante and D'Adamo (2021) recommend that policy makers accelerate messages that sustainability embraces both the environment and the socio-economic spheres. With a global reach, the UN is providing guidance on the communication of sustainable practices in fashion (UN 2023). At the government level, both information and practical measures can be introduced. In the EU, ambassadors have provisionally endorsed a requirement that member states will have until 2025 to set up a separate

collection for textile waste (European Council 2018). At a business level, the same communication media used to send personalised marketing messages can inform consumers about sustainable consumption. These could embrace ethical as well as environmental terminologies, to explain industry, sector, and product implications of consumption at a personal level.

As this paper has demonstrated, being green, ethical, or eco-friendly is not simple. Today, being green is complex, and consumers have busy lives and limited time and attention. In commercial spaces, the way we condense complex factors to be simply understood by more people is through a brand (Holt 2004). Brands are signifiers of quality and tribal flags; we don't need to know all the details that might be explained in footnotes or in the sustainability section of the website, we just need to believe in the meaning behind the logo. To create green brands today, we should build on advertising, social media, and other forms of promotion, celebrity endorsement and product demonstration. Moreover, there may also be new, more personalised ways to build a green branded experience. As consumers engage with brands more interactively, to interpret or resist them to achieve their individual aims, they are more likely to find inspiration from influencers, bloggers and friends on social media. The changing role of the consumer in value creation enables them to take a more active part in the personalisation of products and services. Activity now defines the consumer and to be passive means literally missing 'the action', to be unremarked. Consumers can determine what they want—and when and where—and to contest the spaces of personalisation. With more distributed control and agency over the personalising process, new opportunities emerge to scale up personal initiatives for sustainable consumption, to create new causes and to endorse existing initiatives for the social good. These will be new and exciting challengers for the designers of green personalisation.

4.3. Enabling changes through green design methodologies

Design is an integral part to all systems, products, and services we interact and live with in the modern world. Willis (2018) observes that design has the potential to change behaviours and cultures and the way we, as individuals and societies, operate. Design can not only alter the way things function but may also change our attitudes towards the products we find desirable. Diez and Hankey (2022) stipulate that design is not merely facilitative but can be instrumental in shifting between the status quo and new habits and can even be proactive in closing the gap between product and policy. Designers understand that they are not only problem solvers, but also problem makers, as good, user-centred design sells products, stimulates consumption, and drives environmental destruction (Kuksa, Fisher, and Kent 2022).

In the fashion industry, the role of the designer is most visible in implementing durability and longevity strategies. For some clothing brands, durability is associated with brand identity and its design, where collections are less trend-driven and more influenced by an internal design ethos and design 'handwriting'. The development of niche sustainability collections present challenges that need creative design solutions. For example, an 'upcycled' collection can require designers to resolve certain practical issues relating to fit and colour due to the limitations of the post-consumer waste they work with. Designers' knowledge of fashion products and markets will contribute to thinking about how durability might lend itself to alternative business models such as leasing and renting, but also to design for recycling, disassembly and zero waste pattern-cutting (Claxton and Kent 2020).

Such new design approaches and novel protocols are taught in many higher education (HE) institutions. There are various initiatives that aim to rethink design education and create alternative learning environments, but they are typically siloed in certain institutions or disciplines. Design education in fashion, for example, goes some way to address sustainable use of resources through an appreciation of materials as pre- and post-consumer textile waste and the application of circular economy principles from product conception through production, distribution, use, and end of life stages (Lima 2020). One such holistic initiative is found in the Amsterdam Fashion Institute and their 'Reality School' concept founded on sustainable re-industrialisation with a new focus on the knowledge, skills and competencies required to create sustainable production and consumption (Hall and Velez-Colby 2018). Other disciplines inspire change in different ways. A radical new venture in architectural education—The African Futures Institute—places diversity, equity, and inclusion at the heart of built environment pedagogy, advancing our understanding of how to create a sustainable successful economy and build innovative and regenerative urban futures through the commons. But at present, design largely remains tied to an innovation agenda of efficiency and economic growth in the Global North.

The pressing question is whether designers will have the capability and agency to drive green personalisation. Answering this decisively is difficult because of the rapidly evolving application of design skills and processes, and because of the increasing complexity of the modern economy. We argue that designers do have a significant role to play because they are experts in connecting the needs, wants and aspirations of customers to new designed experiences, have unique abilities to envision new solutions, and, historically, have played a vital role in changing consumption patterns. Design has both tracked new modes of production and consumption, and accelerated them. Today, the dominant form of design is digital design, encompassing both interaction design and the visual design of digital experiences—roles that

did not exist 50 years ago. Designers' roles have also evolved from individuals, to small firms, to today mostly members of teams working inside large engineering organisations. Nowadays, the largest employers of designers are technology companies such as Accenture (2000+), Capgemini (2000+), IBM (3000+), or the ecosystems of large trading platforms such as Alibaba and Amazon. Key skills for designers to have agency and the capability to play a significant role in green personalisation include understanding business constraints and working with engineering, especially software development.

The dominant types of design and the way design is practiced are evolving so rapidly that it is difficult for design education to keep up. Addressing this lag between design methodologies used for training in the HE environment and the methods actually applied in industry would enable new designers to more quickly apply their skills to developing impactful and sustainable paradigms of value, including environmental, social and economic.

There is also a need to overcome barriers to transformative thinking which limit the transfer of sustainable design initiatives from HE to industry. User-centred design has been embraced by industry but is not a sufficient solution to the environmental crisis. The economic growth narrative must be reframed to enable new design perspectives. Specifically, it is critical to develop new or feed into existing sustainable design methodologies such as Transition Design (Irwin 2015) to encourage transformative thinking within HE and industry. The Transition Design framework proposes that to configure situation-appropriate designed interventions, designers should apply four areas of co-evolving knowledge and skillsets—vision for transition, theory of change, transitional mindset and designing systems interventions. The Transition Design framework has existed for a decade and the School of Design at Carnegie Mellon University offers seminars on it regularly, but its implementation across design schools remains uneven. Designer learning and practice is bound by organisational culture, the 'ways of doing things' evident in its prevailing stories, symbols, routines, power structures, and control systems (Johnson, Scholes, and Whittington 2008). Culture is often so deeply embedded that acceptance of new ways of designing becomes difficult. The power to change to sustainable practices may often lie not with designers, but with sustainability 'champions', who may have more significant, strategic roles (Claxton and Kent 2020).

In the digital economy, we see examples of new paradigms changing how people think about consumption. For example, Airbnb founded in 2008, is today, by some measures, the largest hotel chain in the world. It has reframed the hotel business from the ownership of rooms to a two-sided platform that facilitates peer-to-peer room rentals but does not own any rooms itself. Airbnb has changed how millions of people think about where to stay when traveling, designed a system to enable this new mode of

accommodation, and is currently facilitating the exchange of 450 million room-nights each year. It is not surprising that two of the three Airbnb founders have degrees in industrial design.

Design education and practice does not always develop critical reflectivity in designers. One consequence is that at the project ideation stage, designers may not fully understand how their personal beliefs and attitudes will influence their project, audiences, and clients (Kirby-Ginns 2023). Lack of criticality combined with lack of knowledge about the currency of sustainable design, becomes a limiting factor in their ability to implement green personalisation. A further, related barrier is the absence of a widely taught ethical framework to guide designers through sustainable consumption decisions. One way forward is to develop a communitarian approach to design education, which values the 'good life for all' by considering design's contribution to personalisation from the perspectives of society and the individual, liberty and equality, rights and needs and, importantly, the environment.

5. Conclusion

Personalisation has been flourishing in the digital age, persistently nudging consumers to engage in unsustainable purchasing behaviour. The recent attitudinal shift towards more sustainable future for all demonstrates that curtailing consumption is feasible if the right pathways to 'green' personalisation are implemented. We identified three such pathways to tackle the problem of overconsumption. First, to repurpose the 'personalisation machine' for societal good, we need to understand how it functions. By recognising how personalisation works, consumers will be better prepared to resist being exploited. Second, we need to understand why many well-meaning, behaviour-change initiatives were unsuccessful in the past. To achieve this, there is a need to systematically review and analyse project failures to come up with recommendations for future initiatives. And third, new design approaches to solving the problem of overconsumption are urgently needed. The pioneering Transition Design methodological framework, for example, could be adopted more widely across HE institutions and industry. HE design schools would then be able to equip their trainees with the necessary skills to repurpose the personalisation machine for societal good. Furthermore, to reframe personalisation as 'green', there is a need to devise a multi-stakeholder roadmap, containing sets of actions and practical solutions for disrupting the consumption status quo and boosting the development of ethical business, design and economic models. Recent initiatives such as Society 5.0, led by Alcatel-Lucent Enterprise, pledge to place humanity at the heart of any future innovations, which illustrates that there is already an appetite for positive change in some businesses. The 'society as a consumer' framework proposed by Kuksa, Fisher, and Kent (2022) advocates adopting 'green' personalisation methodologies to deal more

effectively with the complex societal, cultural, and most importantly environmental problems amplified by digital technologies. Personalisation is a powerful tool that could be repurposed to drive positive change and forge a more sustainable and equitable future for all.

Note

1. This term was first introduced by Kuksa (2023) at MCPC-CARV 2023.

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