

“WHY DO WE BUY MASS CUSTOMISED PRODUCTS?” - CONSUMER’S PERSPECTIVE OF SUCCESS FACTORS FOR ONLINE MASS CUSTOMISATION

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Abstract: *Mass customisation has become a prospective business strategy for many industries. Despite the great efforts that have been put into producing such systems (e.g., NikeID), a survey indicated that nearly half of consumers still prefer to buy mass produced products [8]. Another study also concluded the increase in mass customisation has led to a decline in customer satisfaction of the sales process [9]. Given these considerations, this paper aims to, from the consumer’s perspective, investigate the factors influencing consumer purchase intention of online mass customisation. Overall, 15 participants were invited to customise a product using one of the selected websites and one-to-one interviews were conducted afterwards. We have found that consumer purchase intention is influenced by multiple factors and price is the primary concern. Based on the interview results, strategies have been given for both new start-up companies and companies that are already strongly established to employ mass customisation. These findings help us learn about the consumer experience of mass customisation and contribute to the implementation of best practices for mass customisation.*

Key Words: *Mass Customisation, Purchase intention, Success factors, Consumer experience*

1. INTRODUCTION

Mass customisation has grown as a prospective business strategy for many industries over the last few decades. The term “mass customisation” was introduced by Davis in 1987 and was considered to be a new approach to business where companies attempt to offer unique products and services to customers [30]. Davis emphasized the paradox of mass customisation - it ‘is understood to be both part (customised) and whole (mass) simultaneously’ [31]. In other words, mass customisation on the one hand attempts to satisfy the specific needs and desires of individual customers; while on the other hand it is supposed to provide products and services for a relatively large market. Pine [32] further

developed the concept and considered it as “a synthesis” of mass production and customisation, i.e. “the mass production of individually customised goods and services”. Despite having various definitions, the concept of mass customisation is centred on “producing goods and services to meet individual customer’s needs with near mass production efficiency” [33].

Technological developments now make mass customisation a practical possibility. Powerful computers, high-speed Internet and sophisticated web browsers facilitate the efficiency of developing customised products. Websites therefore become the primary means to turn mass customisation into business practice, which leads to the popularity of online mass customisation. A large amount of effort has been put into creating such online mass customisation websites. On the one hand, companies like Nike, Ford and Dell have set successful examples for the traditional manufacturing industry to embrace the mass customisation era. According to Forbes, Nike has been able to raise their mass customisation sales from 22% of total sales to 30% in 2015, growing their overall margin by 1.4% year on year¹. On the other hand, new start-up mass customisation companies are dedicated to providing personalised products and service, for example, Snapfish² and Zazzle³. To seize the business opportunities, e-commerce company Amazon also launched Amazon Custom to encourage companies and merchants to offer customisable products or services on their website.

Despite the great efforts that have been put into turning the concept of mass customisation into practice, the reality is not always optimistic. Compared to the success of employing mass customisation in a traditional manufacturing industry, new start-up companies suffer from a 20% failure rate which means 1 in 5 companies

¹ <https://rctom.hbs.org/submission/nikeid-polishing-the-shoe-buying-experience/>

² <https://www.snapfish.co.uk/2/home>

³ <https://www.zazzle.co.uk/>

could not establish themselves well enough on the market to become a long-term success⁴. Even for the traditional manufacturing companies, their profit from mass customisation has not taken a big portion compared to their mass production sales. For example, although NikeiD sets a successful example, mass customisation only represents 20% of sales in Nike's annual profit which still has a lot more room for growth⁵. More importantly, the majority of consumers seem to have never purchased any mass customised products. According to research performed by the business advisory firm Deloitte, 36% of consumers say they are interested in personalised products or services [8, 25]. However, this desire contrasts with a relatively low take up, only one in six of consumers have ever bought customised products or services [8, 25].

The discrepancy between the passionate attempts from industry and the 'wait and see' attitude from consumers leads to a research need: why do consumers not buy mass customised products? In other words, what factors influence consumer decisions to buy mass customised products? Although mass customisation has attracted significant research interest in recent decade, most research efforts focus on identifying and classifying the most efficient and effective ways in which mass customisation can be implemented [1]. Relatively little research has investigated consumer needs and desires towards mass customisation, while even fewer studies provide empirical evidence from the consumer perspective to support their investigation. Research on e-commerce has indicated that the consumer experience is significant to consumer trust, loyalty and repurchase intention [12]. Hart [10] suggested that the most important factor determining success for mass customisation is "customer customisation sensitivity" which considered the uniqueness of consumer needs and the sacrifice gap between the desired product and the products available in the market.

Given these considerations, this paper aims to investigate the factors that influence consumer purchase intention of online mass customisation. The focus is particularly on young consumers aged from 16 to 35. According to Eurostat Statistics, consumers aged 16-44 were the dominant e-shoppers, especially young consumers aged 16-24 who had the highest proportion of e-shoppers purchasing clothes and sport goods (71 %) ⁶. Meanwhile, internet users with a higher level of education are more likely to spend their money online. As for mass customisation, those under 40 are more interested, with 43% of 16-24 year olds and 46% 25-30 years olds attracted to personalised products and services [25]. Therefore, understanding the highly-educated young consumer's attitude towards mass customisation, especially the factors that influence their purchase intention, will help to discover the 'holy grail' for the success of mass customisation.

⁴ http://mass-customization.blogs.com/mass_customization_open_i/2012/11/the-mc-graveyard-ideas-that-did-not-make-it-kidlandia-strikes-colors.html

⁵ <https://rctom.hbs.org/submission/nikeid-polishing-the-shoe-buying-experience/>

⁶ http://ec.europa.eu/eurostat/statistics-explained/index.php/E-commerce_statistics_for_individuals#General_overview

In order to gain a deep understanding of consumer needs and desire towards mass customisation, this paper takes an exploratory approach. Participants were invited to customise a product using one of the selected websites and one-to-one interviews were conducted afterwards. Based on the interview results, strategies have been given for both new start-up companies and companies that are already strongly established to employ mass customisation.

2. LITERATURE REVIEW

As a strategy applicable to many businesses, mass customisation attempts to provide personalised service and products to meet each consumer's needs and desires. This has been considered as the key significance of mass customisation [17]. In order to achieve mass customisation, consumers take part in the design process which used to be seen entirely as within the domain of companies and manufacturers [18]. A number of pieces of research have confirmed the positive influence of consumer active participation on their purchase intention of mass customised products. Simonson [4] believed that compared to website automatically personalise offers for consumers, allowing consumers to design the product themselves is important for mass customisation to be successful. Franke et al. [7] confirmed that taking part in the design process led to a positive value increment and increased consumer willingness to pay. Further studies [6] identified that there are two benefits, which can be derived from the experience of customising a product and the possession of a customised product, they are creative-achievement benefit and hedonic benefit. These two benefits help consumers feel the pride of authorship and its intrinsic reward.

Existing studies also identified various approaches for consumers to customise a product. A number of studies agreed that an attribute-based customisation approach, which allows consumers to decide their preferred level for each attribute of the product, can increase consumer perceived usefulness, enjoyment and satisfaction and lead to a higher probability of purchase. This is in comparison to the alternative-based customisation approach which allows consumers to make a choice among a set of fully specified product alternatives [26-28]. Hermans [29] further considered the way that a product can be customised and categorised four different mechanisms for customisation: Veneer, which allows consumers to customise products by adding a visual decorative layer to a product; Modularity, where products are decomposed into a set of discrete modules and options for their assembly into a customised design are presented to the user; Parametric, which allows consumers to customise a product by changing specific parametric values; and Generative, which creates 2D or 3D forms based on a built-in generation procedure.

Although inviting consumers to join the design process has been considered vital to meet individual needs and desires, consumers may not have a well-defined preference or they may not know what they actually want at the beginning of the design process, and sometimes even if they know what they want, it is difficult for them to describe [19]. Simonson [4]

suggested two dimensions of consumer preference to segment consumers into four groups. The two dimensions are the degree to which consumers have stable, well developed preferences and the consumers' self-insight into those preferences. He also claimed that the majority of consumers have poorly developed and unstable preferences and they tend to have limited insight into their own preferences as well. Given these considerations, the need to fit with consumer preference or being sufficiently attractive are two key factors for consumers to purchase the customised offers. In particular, the more options presented to consumers the more likely they will find the product attractive to them and purchase it [4]. That is because consumers tend to rely on comparisons to assess the value of products. Furthermore, results of empirical studies have shown that consumers are actually disappointed by the limited choices offered by most existing online mass customisation websites [20]. Other studies indicated that the majority of consumers would like to have more and a larger variety of choices and to also play a more active role in the design of the products [21]. Franke et al. [7] also found that providing consumers with higher design freedom generates higher willingness to pay.

However, not all studies agree with the “more are better” effect for deciding the number of options presented to consumers. Consumers have been found to be overwhelmed by the number of choices provided by manufacturers, which may lead to ‘mass confusion’. This is because excessive choices result in information overload [22]. Since consumers sometimes lack the ability to process overloaded information, they feel confused and annoyed when they are offered too many choices [22]. As a result, this negatively influences consumer enjoyment of customisation and the satisfaction in producing the final product [23]. Huffman and Kahn [24] found that the relationship between consumer satisfaction and the number of choices can be demonstrated in an inverted U-shaped fashion, i.e. after reaching a certain point, the more choices provided, the less satisfied consumers are. Another proposed approach to this problem is to convert the number of choices into the number of products in a bricks-and-mortar store to get an adequate understanding of how many choices the customer should have [22].

In addition to meeting individual consumer needs and desires, another key aspect of mass customisation is it is intended to offer customised products or services at a near mass production price. However, due to the early development of mass customisation and the limitations of manufacturing technologies, most customised products are more expensive than mass produced products [1]. This has been identified as the main inconvenience of mass customisation [1]. Nevertheless, a number of studies have confirmed that consumers are willing to pay a price premium for customised products [5]. According to Forrester research, 81% of people are willing to pay more for customised products [11]. In this case, mass customisation can help increase a company's profitability by lowering consumers' price sensitivity [3]. Since price is an important criterion for value judgment, the price premium should be in line with the additional value created [5]. Bardakci and Whitelock [1] found in

their user studies that customers were willing to pay up to £1,400 or approximately 10-15 percent more than mass produced product prices. When taking cultural influences into consideration, the price premium that consumers are willing to pay is more complicated. Moon et al. [2] found that consumers in individualistic countries tend to respond to the products more favourably than consumers in collectivistic countries when the personalised products cost the same as standard products or a moderate price premium of up to 15%. However, their response deteriorates considerably and their purchase intention is lower than that of collectivistic consumers when companies charge up to a 30% premium. Interestingly, collectivistic consumers' purchase intention does not decrease even at this price level. They tend to tolerate a higher price more in order to obtain customised benefits. A few studies have attributed consumer willingness to pay for the price premium to whether or not they can gain a positive emotional experience through the design process and whether or not mass customisation can offer a value increment. [6][7]

In recent years research interest has been attracted to the importance of website design in the success of mass customisation. As the primary communication tool between consumers and manufacturers, a website transfers the design capability from manufacturers to consumers. Furthermore, it triggers positive emotional responses and promotes consumer willingness to pay [6]. Therefore, website design has been considered as a key success factor in implementing a mass customisation strategy. Franke and Pillar [34] proposed three main components of a mass customisation website: core configuration software which provides design options and guides consumers through the configuration process; a feedback tool which gives feedback information and visualises design variants; and analysing tools, translating consumer designs into construction plans. von Hippel [14] suggested that an effective website for user innovation should meet five important objectives: learning by doing via trial-and-error; providing an appropriate “solution space”; being “User-Friendly”; offering module libraries and a producible “language” to translate user designs for production. Trentin et al. [13] proposed five capabilities to support consumers to make the decision that best fits their needs, including focused navigation capability, benefit-cost communication capability, flexible navigation capability, easy comparison capability, user-friendly product-space description capability. Sandrin et al. [35] concluded that a mass customisation website with higher flexible-navigation, focused-navigation, and easy-comparison capabilities enhanced the utilitarian benefit as well as the consumer-perceived uniqueness benefit and self-expressiveness benefit. Zhao et al. [15] also proposed an evaluation model to assess if a 3D mass customisation website can create a satisfying consumer experience by addressing four aspects: individual differences, solution space, interaction design and enabling technologies.

3. METHODOLOGY

3.1. Research question

As discussed in previous sections, the main aim of this paper is to investigate the reasons why consumers buy or do not buy online mass customised products. Therefore, the research question is:

RQ: What are the factors that influence customer decisions to buy mass customized products?

In order to find answers to this research question, an exploratory approach is taken, and the procedure is designed to investigate the research question from the consumer's perspective.

3.2. Procedure

The purpose of the user study is to explore factors that influence consumer online purchase intention of customised products, leading to the discussion of success factors for the mass customisation industry. One-to-one semi-structured interviews were conducted in order to gain an in-depth understanding of consumer experience of shopping on mass customisation websites and the reasons why consumers purchase or do not purchase online customised products.

Due to the consideration that mass customisation is not a popular online shopping form yet and not everybody has visited or purchased a product on mass customisation websites, we invited participants to design a product using one of the mass customisation websites we selected before the interview. The user study included three stages. In the first stage, participants were invited to customise a product using one of the online mass customisation websites. After this was completed, an interview was conducted in the second stage. Questions started from learning about consumer experience of customising the product, for example, 'Can you tell me what you have done to produce the final product?' 'Tell me about your experience of using this website?' and 'Was there a moment when you felt satisfied or dissatisfied with using the website to customise the product?'. After that, questions focused on investigating consumer purchase intention of the customised product, such as 'Did the final product meet your expectation?' 'Would you buy the final product and why?' In the final stage, a demographic questionnaire was filled in by the participant. Questions were designed to gather information about consumer gender, age, education, previous online shopping experience and online mass customisation experience.

3.3. Stimulus

Two mass customisation websites were selected for the user study: Adidas customize (see Figure 1) and Nervous System (see Figure 2). The reason for selecting these two websites was due to two considerations: first, they represent different approaches to mass customisation website design as reviewed in the previous section. Different approaches may result in different user experiences and purchase intention. Second, they represent successful cases of mass customisation from

traditional manufacturing companies and new start-up companies, and they both are in the fashion industry.

Adidas customize employs an alternative-based approach. It is provided by footwear manufacturing company Adidas, and has set a successful business example for the traditional manufacturing industry to embrace the mass customisation era. Nervous System is a design studio which applies computer simulation to generate designs and digital fabrications. In addition to selling professionally designed artefacts on its website, Nervous System also employs an attribute-based approach for customising products by using their online apps. The product selected for participants to customise was a jewellery piece which could be designed either as a ring or a bangle.

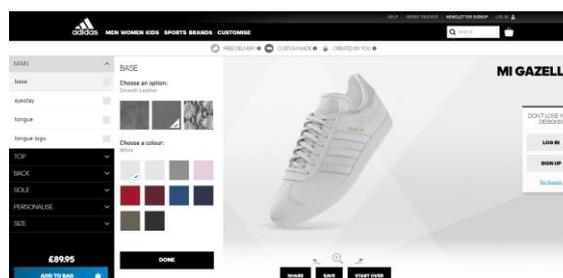


Fig. 1. Screenshot of Adidas customize webpage.

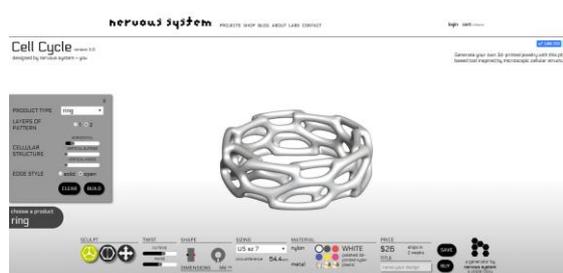


Fig. 2. Screenshot of the Nervous System Cell Cycle customization webpage

3.4 Sample

In total, 15 participants took part in the study. They were randomly assigned one of the two websites and directed to customise a specific pre-selected product. Among them, 6 are male and 9 are female. 6 participants are aged 18-24 and 9 participants belong to the 25-34 age group. Regarding their educational background, 8 participants had already gained a master's degree, 4 of them had achieved a bachelor's degree and the remaining 3 participants were undergraduates. Only 3 participants had previously shopped on mass customisation websites before the study. In comparison, the majority of participants (n=12) had not spent any money on purchases using a mass customisation website.

4. RESULTS

4.1 Effects of customisation

All the interviewees mentioned that they were excited about the idea that they could design a product and have it made and delivered specially for them. Typical comments included:

'It is very interesting to play with all the options and design the ring. It is different from normal online shopping websites.'

'I think it is great fun that you can design a product according to your preference rather than select a ready-made one from a long list.'

However, a few interviewees felt frustrated that the options provided by Adidas were very limited and they could not find the unique colour they wanted. This also led to their dissatisfaction with the customisation experience and they claimed that the final product failed to meet their expectation. Typical comments included:

'(Adidas) The choice of colour is very limited. Despite the variety of all the shoes, your choice of colour is between the choice of 5 or 6 colours. I don't understand why you can't have colour pick and just change it... if you think about it, say 7 people customise the same shoe, because it is such limited choices, in the end it doesn't feel personal.'

'(Nervous System) I would like to have more choices to make further changes to the design, for example, putting my name on the ring. I also think there should be a choice that the circle hole can be replaced by other patterns, for example heart or square pattern.'

In contrast, participants were more satisfied with the customisation experience offered by Nervous System that they could change the shape of the product. Most participants agreed that the final product met their expectation. A few participants especially mentioned that the website offered tools which could change the internal structure of the product.

'I bought a laptop from a website that you can choose different components from a list, but this website provides you with tools that you can change the shape of the product and see the effect immediately, it is very different experience.'

4.2. Price

When asked if they would purchase the product they customised, only two interviewees from the 15 said they would like to purchase the product they designed. The majority of the remainder gave price as their primary concern, especially those that were using the Nervous System site. Comments included:

'I would not buy this bangle at that price.'

Although price seemed the most frequently mentioned answer for not purchasing their designed product, surprisingly when asked if they can accept to pay a premium price for the customised product, only one interviewee believed that a mass customised product should be as cheap as a mass produced or even cheaper than a mass produced product. All other participants said they were happy to pay a higher price for the customised products. The price premium they said they would be willing to pay ranged from 10% to 30%. One interviewee

specifically said they would be willing to pay £30 more for the product they customised. Nevertheless, participants also commented that the price premium they were willing to pay to some extent was dependent on how satisfied they were with the final product.

'The price is ridiculous...to be honest, I think it should be cheaper than mass produced products because it only creates the product when someone needs it so it should be cheap because you do not waste any material if you just make it for that one person.'

'It is difficult to say (how much more I would like to pay for the customised product)...I guess it depends on how desperate I want it. If I really like my design and it is very unique, I would like to pay more for it.'

4.3. Trust

Trust was also indicated as one of the justifications for not wishing to purchase the final product. This was especially the case for Nervous System, which the participants had not encountered before the interviews. Participants then gave suggestions on how to increase the trust towards a new start-up mass customisation company, including free refunds and using a secure https website connection:

'Nervous System, I don't like the name, of course I will be nervous if I spend that much money on a website I've never heard about.'

'If I could free refund my order, I will buy it. I hope the refund process is not too complicated.'

'I usually shop on websites with a 'secure' label in front of their (IP) address. I think the website with a secure label means it has been verified, I feel safe to shop on it.'

4.4. Website information quality

All the participants pointed out that the customisation tools on the Nervous System website were not intuitive to use and there was not enough information to explain what each tool was and how it could change the product. They had to spend time to figure this out for themselves. In the end, a few participants could not figure out the functionality of the three main tools until the researcher told them in the interview. This was also given as an influential factor for why they did not wish to purchase the final product:

'I am still not entirely sure, this, the green one (button), I don't know what's that about.'

'The buttons are not intuitive. I don't know what they can do if I just see them. Only after I click them I understand.'

'The final product is very expensive, so I would like to know all the buttons and then spent time

designing the product. But if I did not know what the button can do, I would not want to buy the product in case I missed something.'

4.5. Other reasons

The reason for not wishing to purchase the product consumers designed on the Adidas site were various. In addition to 'the customised shoes are more expensive than normal shoes', other reasons included that the participant did 'not care about shoes', 'not like the brand' and 'cannot find the colour they want'. Typical comments included:

'I am not really a shoe person... I don't care about the price because I know I won't buy it'

'This brand of shoes is not something I like, so I won't buy it'

'I like one type of shoes but there are not many colour options, so I have to choose a different shoe to design because it has more colours.'

'It is more expensive for the customised Adidas shoes, and the customisable choices are mainly colours, the style and the shape of the shoes are same to the mass produced ones. As I am not that type of person who cares about being personal or being unique, I think the mass produced ones are good enough for me.'

5. DISCUSSION AND CONCLUSIONS

The aim of this paper is to find answers to the research question RQ: What are the factors that influence customer decisions to buy mass customized products? 15 participants were invited to design a product using one of the mass customisation websites we selected: Adidas and Nervous System. After this was completed, an interview was conducted and a demographic questionnaire was filled in by each participant. The previous section (section 4) summarised the research findings and results from the interviews. In this section, we will further discuss the results and draw conclusions on the potential solutions of improving consumer purchase intention, contributing to the success of the mass customisation industry.

5.1. Discussion of price sensitivity

This study confirmed that, in consumers' minds, mass customisation adds value to the product, for which they are willing to pay a premium. However, when it comes to a specific product, consumers become very price sensitive. Price is one of the most important considerations that influence consumer purchase intention. This may be because the participants in this study are mainly young university students. Although they are the main consumer group for online shopping, they are not affluent with a high level of disposable income. A few participants mentioned that the reason they chose online shopping was because it is cheaper and it is easier to compare prices online.

However, this does not mean we should not consider young students as potential consumers. In the interview, three participants mentioned that they had purchased mass customised products before, but usually for special occasions or as a gift to friends or family. This indicates that there are still motivations and opportunities for young students to buy customised products.

In addition, from this study we can see that consumer purchase intention is influenced by multiple factors and price is not the only concern. When other factors (e.g., limited options, lack of trust, poor website design) do not meet consumer expectation, price becomes an obvious point to 'blame' for not buying the product. In this case, improving the consumer customisation experience will help to increase their purchase intention.

5.2 Suggestions for Adidas

From the interview results we can see that participants gave different responses to Adidas and Nervous System when explaining the reasons for not purchasing the final products. This indicates that new companies which employ mass customisation from the beginning may need to apply different strategies when compared to companies that are already strongly established which wish to start using mass customisation.

As a successful sports apparel manufacturing company, Adidas has gained a large number of loyal customers and the brand is commonly known. In order for Adidas to attract more consumers to engage with their customisation service, the key is to consider the speciality of their product, identify the unique consumer needs and desires and offer options to meet their expectations. The customisable options on the Adidas website are mainly to change the colour and material of different parts of the shoes, and the colour options are common colours that often used in their mass produced shoes. This seems not to meet consumer expectation of having truly unique colour choices. In this case, it suggests that a colour palette can be used to allow consumers to choose whichever colour they want. This will give consumers unlimited freedom, though it may lead to inefficiency and difficulty from a manufacturing perspective.

The second suggestion is to provide more personal features to customise. For example, allowing consumers to type in the measurements of their feet and produce a pair of shoes that exactly fit the shape of their feet. This can also be implemented with 3D scanning technology. Since an attribute-based approach seems to gain more positive feedback from the participants than the alternative-based approach, Adidas may also consider adding more 'fun' interaction mechanisms to their customisation process rather than just allowing consumers to click buttons and select colours.

5.3 Suggestions for Nervous System

Nervous System is a new start-up company which provides mass customisation service as part of their business. The customisable products on their website include jewellery and apparel design. In order to attract more consumers to their customisation service, the company should firstly identify their target consumers. The products on Nervous System have a unique design

style which is markedly different from high street fashion design. It is important to target their customisation service to the right consumer group.

Second, it is important to build up the trust between the consumers and the company. From the interview, we can see that participants held a suspicious attitude towards this website – they had never heard of the company and they did not know if this website could be trusted from the information provided on the website. An effective way to increase consumer trust is to provide excellent customer service. For example, when consumers have problems to interact with the website, it will be good if the consumer could be connected to the customer service and gain real-time help through online chat or a telephone call. This will on the one hand help consumers solve the problem and avoid their frustration of using the website. On the other hand, it helps to build the trust between consumers and companies because consumers can feel the company cares about them. In addition to customer service, we can see from the interview that the guarantee of free return and refund will also help to boost consumer confidence with the website, therefore increasing their purchase intention.

In the end, as reviewed in the previous section, website design is critical for the success of mass customisation. A high quality website also helps build consumer trust towards the company. This is extremely important for start-up companies because the website is the primary means that consumers get to know a company. In the interview, all participants complained that Nervous System website failed to provide enough information for them to understand how to customise the product. Some of them mentioned this influenced their decision of purchase. Previous studies [13-15] provide useful suggestions on the design of mass customisation websites which can be a reference for start-up companies.

The biggest limitation of this study is its exploratory nature. Although interviews help gain deep understandings towards the reasons behind consumer behaviour intention and to draw preliminary conclusions, further studies are needed to test the findings of this study on a larger scale. In addition, this study investigated mass customisation purely from a consumer perspective. However, the implementation of mass customisation is closely related to manufacturing technologies. The suggestions given in the previous section may not be easy to take into practice in reality because of the limitations of current manufacturing technologies. Further studies are also needed to learn about the development of manufacturing technologies to make the conclusions more practical.

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