



# IS MASS CUSTOMISATION OF FOOTWEAR REALISTIC?

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Shoe making is a fairly traditional business, despite the new manufacturing technologies, widespread changes in markets and evolutions in consumer attitudes and preferences that have appeared over the years and, in particular, more recently. Indeed, there have only been a few truly radical changes in terms of manufacturing approach or organisation and business models. The concept of mass customisation (MC) is one of them and, potentially, a most exciting one.

The idea first appeared in 1992 in a book by Joe Pine called 'Mass Customisation: the New Frontier in Business Competition'. No one took any steps to turn it into a reality, however, until the early years of the new millennium. At that time CAD systems were at the top of their development, process automation and flexibility were the key words in shoe manufacturing and new technologies appeared to allow the scanning of body parts in order to produce accurate digital models of them. Since then, much has changed.

The huge EUROShoE project, funded by the European Commission, explored market sensitivity to this new way of selling and producing shoes, tackled the major technological

challenges that were on the way and demonstrated the feasibility of a 'consumer centric' process flow from sale to design and manufacturing. Books were written on the specific topic of footwear and MC, while at every gathering of the Mass Customisation and Personalisation Congress since it began in 2011, there were sessions specifically dedicated to it. Despite all that happened during those ten years, mass customisation for footwear is not here yet.

## CONSUMER CENTRICITY

What exactly do we mean by mass customisation? There are two basic parts to the concept: consumer centricity and efficiency of production. One well known definition in fact claims that it means manufacturing a product based on the individual requirements of a specific customer with near mass production efficiency and, therefore, at a cost little different from that of a standard product. That is a serious and challenging claim to make.

The consumer centricity aspect particularly refers to the way in which consumers participate in the various processes from design to manufacture of their shoes. In the case of a

|          | BENEFITS OF MASS CUSTOMISATION                                                                                                                                                                                                                                                     | DRAWBACKS OF MASS CUSTOMISATION                                                                                                                                  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CONSUMER | Greater individual satisfaction<br>Easier to find the product and size desired<br>Improved comfort from better fitting shoes<br>Consumer talks to supplier<br>Consumer feels producer cares                                                                                        | Consumer pays a higher price<br>Consumer must wait for the product<br>They don't see, touch and feel the product<br>Issues regarding ownership of biometric data |
| PRODUCER | Manufacture only what is already sold<br>No inventories at point of sale<br>Reduced or no discounted sales<br>Less space needed so less costs for retailer<br>Producer knows its consumers<br>Greater consumer satisfaction and fidelity<br>Higher added value in the sold product | New negotiations with retailers required<br>Process becomes more complex<br>Potentially higher product costs<br>Requires reorganisation of processes             |

personalised product, they certainly have a more active role than would normally be the case with a mass produced one and therefore expect to be the centre of attention. This, however, no longer appears to be enough and Joe Pine has revised his original theory on personalisation by introducing two further concepts.

First, that of 'experience' to emphasise how the time spent by a consumer in the store should be perceived and remembered as a memorable experience that completes the final feeling of owning a pair of shoes specifically designed and made for them. Satisfying their interests and tastes is not enough, the purchase needs to become an experience in which the atmosphere, the manner in which it takes place, the content (even in terms of entertainment) of the technologies that are at work in the process, all play a relevant role. Pine has refined this into a theory that speaks of an actual new economy based on such an experience in his book *The Experience Economy: World is Theatre and Every Business a Stage*.

Second, today's consumer also looks for authenticity in the products purchased, involving transparency of content, visibility of processes involved, obvious quality, total attention to their individual needs and a desire for uniqueness. This is the minimum threshold shoemakers have to reach in order to truly capture the attention of customers and, at this level, requires wide knowledge of their behaviour and a total change in the way they deal with the end user. Furthermore, it also calls for a dramatic change as to whom they consider to be their customers: no longer retailers but the end users of their products.

MC in fact re-establishes the consumer/producer relationship that was lost as shoemaking developed from a craft activity into an industrial one. This implies benefits and drawbacks for both the consumer and the producer. The key to success is to find the right balance whereby the benefits surpass the drawbacks for both parties. The table above lists the most important benefits and corresponding drawbacks for both producer and consumer.

MC is also a structural transformation in the consumer/producer relationship which not all companies are prepared for. In many cases, the radical mind-shift required let alone the investment in new organisation or

technologies involved frightens companies off. Having said that, however, what might be a major obstacle for a well established company could easily become a motivating factor for newcomers and innovative start-ups to actually base their business model on such an original approach.

## EFFICIENCY OF PRODUCTION

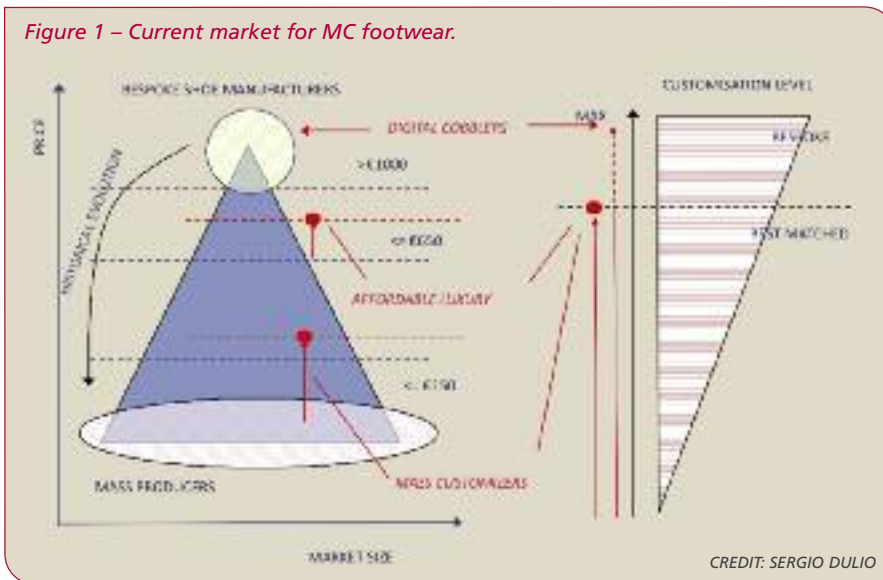
This is the second element that mass customisation relies on. It is well known that individuality goes against economies of scale, requiring highly flexible processes and organisations capable of handling the diversity of every single order coming in. In an industry predominantly geared to volume production, maintaining low extra costs with batch sizes of one pair has been the goal of research and development work by universities and technology suppliers alike. Many of the major technical stumbling blocks have now been resolved and technologies are available that, if correctly applied, preserve cost efficiency more or less independent of batch size. Despite all this, two other factors still cause companies to hesitate.

Changing the way things are done and processes are organised in traditional shoemaking companies is always a



*Choosing a shoe that both appeals and fits well can be a dilemma.*

Figure 1 – Current market for MC footwear.



difficult task. As briefly mentioned earlier, it is not just the financial investment that may be required but very often the change in mindset that moving from a rigid, batch-oriented set-up to a highly responsive and flexible one entails. It means switching from manufacturing chains to lean cells, from analogical to digital process control, from a push to a pull production model and, as we have said, change-over costs are often considered to be too high.

The second impediment is the need for standard mass production and one for customised products to coexist in the same factory. This is especially true for conventional companies that want to explore MC while, at the same time, retaining their position in the traditional market which would be a necessity in at least the early stages of any MC project. The main problem they would face is how to run single unit orders on the same production lines used for their standard footwear, making sure that the first are delivered to customer specification and on time, while not disturbing the on-going output of the second. Whilst an existing dedicated sample line would certainly help, the typical short and frequent development cycle for new products and collections might not leave sufficient spare capacity.

A combination of these two factors has created something of a deadlock and is the main reason mass customisation has not spread in the footwear industry. Traditional companies with an established market access, solid product positioning and, moreover, an adequate production capacity, are reluctant to take on the additional costs of a change to MC. New entrants and start-ups on the other hand which realise the possible potential and are already geared to operate in a consumer centric scenario, lack the manufacturing capacity to serve their customers and struggle to find suppliers willing and able to support them.

## FUTURE OF PRODUCTS

A study by the Forrester Group in March of this year contains an interesting survey on the subject of whether MC can really be considered as the 'future of products'. It contains examples and case studies leading to a set of

recommendations for companies on how to use MC in order to pursue customer centric strategies. Although not all the contents of the study are directly applicable to the footwear industry, it does contain a valuable set of definitions to highlight how MC differentiates from mass production.

- Product features are identified by individual customers
- Product design carried out at point of sale by individuals
- Market presentation allows individual choice options
- Variations come from individual customers ideas
- Customer needs are defined by individuals within defined boundaries
- Customer involvement occurs at point of sale

A word of warning however: identifying the specific features and design of footwear by customers is a very delicate issue due to the complexity of the task and the high skill required to perform it in a consistent manner. Nevertheless, the potential of allowing an end user to ‘play’ with the design or, at least, certain predefined elements in order to add uniqueness to their customisation remains almost totally unexplored. It could in fact become a powerful lever for a widespread, consumer-pushed adoption of MC. A lack of appropriate end user oriented design tools and determination on the part of shoe manufacturers has, until now, relegated it to a mere vision for the future.

## CURRENT POSITION

As things stand, the state of adoption of MC for footwear is clearly shown in *Figure 1*. The typical price/market size pyramid is set against a 'customisation level' that mainly refers to how much of a shoe is actually designed and manufactured to the individual requirements of the end user. At the low end of the scale are mass produced shoes with no degree of customisation. At the highest end we have fully bespoke footwear for which all the elements of the shoe and, in particular the last, follow the biometric data of the customer's feet and their aesthetic requirements. Between these two extremes, we have shoes aesthetically personalised that are closer to the lower end as foot

biometrics are totally ignored. Towards the upper end, we find best matched-fit shoes where aesthetic customisation is combined with foot and last dimensional data matching so that the closest available fit is provided.

We can see from all this that the highest level of customisation is typically offered by a new generation of hand-shoemakers, whom we can call 'digital cobblers' and who use modern digital technology to produce truly bespoke shoes at prices of €1,000 (\$1,500) or more. It is therefore clear that at the apex of the triangle there will only be a few wealthy customers.

A little lower down, we find the 'affordable luxury' category where the level of customisation offered is lower (typically best matched fit and aesthetics), as is a selling price which a relatively larger number of consumers can afford. A recent study conducted by a team of students at the Polytechnic of Milan School of Management indicated that if the price of MC shoes stayed between €400 (\$580) and €600 (\$940), almost 17% of those interviewed would buy customised shoes. Significantly, their average age was between 40 and 55.

The vast majority of consumers at the base of the triangle buying at up to €150 (\$220) per pair are either totally excluded or have to live with low levels of customisation typically centred on a choice of colours, materials and aesthetic details, but without any of the benefits in terms of fit and comfort typical of the higher levels.

It is worth noting that major sports shoe brands including Nike, adidas, Reebok and Asics are there, together with some less-known but very active start-ups. Big brands such as these certainly have the potential to boost MC. However, although it is almost impossible to obtain reliable sales figures, those that they currently generate through customised offerings must be well below full potential and justify our initial statement that the mass market remains largely untouched by MC and its very real benefits of fit and comfort.

What all these cases have in common and also represents probably the most relevant differentiation factor with regard to mass production is that whatever the level of customisation, all these shoes are strictly made to order; they are neither in the shop or even in stock at the factory until the client chooses the one he likes and places an order. A great challenge for the vendor but a major advantage, as we will see, from other standpoints.



*Many bespoke shoemakers use digital technology.*

CREDIT: CALZOLERIA RIVOLTA – MILAN



*Modern laser foot scanners are accurate and consistent.*

CREDIT: CALZOLERIA RIVOLTA – MILAN

## A KEY QUESTION

This, brings us back to the question as to how MC can reach a mass market in order to offer the greatest possible benefit to the highest number of consumers? There are two ways in which this might happen: 'democratisation' and 'long tail effect'.

Democratisation refers to a situation in which a greater number of big brands, beyond just the sports shoe sector, move to MC and exploit it at various levels to lower the cost of customised products such that the concept reaches as far as possible down the economic value chain. In order to assess how realistic this possibility might be, we must consider several factors, the first being the market. Does one exist for this kind of product/service combination and, if so, how big is it? Strangely enough there are no recent quantitative studies on this subject. The only specific data was gathered during the EUROShoE project in 2001. This suggested the '20/20/20 rule', namely that if the end price of customised shoes could be held to within 20% more than the price for a normal pair of the same shoes and delivery time was no more than 20 days, almost 20% of consumers questioned would be prepared to buy them.

The numbers would need to be updated and might now be possibly even more favourable. Converting this into actual pairage potential and revenues achieved bearing in mind the higher selling price and higher margins for producers could then yield a volume in excess of 100 million pairs per year, worth well over \$14 billion for Europe alone. While this is an educated guess, it is still appealing enough to warrant further consideration.

The second point is better foot measurement. For the concept of selling shoes based on the true biometric data of the individual customer to spread to a mass market, low cost, consistent and easy to use foot measuring technologies must become widely available to the public. Modern foot scanning machines are technically almost perfect. What is missing is a way to make them available in every shoe store or wherever a convenient Internet connection is available such that anyone can go and have their feet measured.

It is an intriguing scenario that lends itself to a series of additional considerations that would be worth an in-depth discussion for which is no room here. While it cannot be said that this possibility is really around the corner, movements in its direction are evident. The combined effect of market appreciation and a widespread availability of foot measurement systems could be a trigger for brands to move towards MC and bring its potential benefits to the mass market.

The long tail effect is discussed in a book by Chris Anderson and can be summarised as a situation in which the combined value of all the millions of items sold in only small quantities equals or exceeds that of the few sold in millions. So, could it come about that the niche markets in which customised footwear is found today—such as formal men's shoes, casual men's and women's, trendy women's shoes and various specialist sports shoes—grow in number such that variety and pairage sold increased to a point where it rivalled mass produced footwear? It would be worth carefully analysing these various niches as there is a feeling that potential numbers might be more than expected and that this growth could turn out to be more than mere anticipation.

## THE ENVIRONMENT

A final and, perhaps unexpected, benefit that could arise from the mass adoption of MC and footwear is its impact on the environment. In the final chapter of 'Mass Customisation and Footwear Myth, Salvation or Reality' published by Springer in 2007, the authors could only make a relatively short analysis of the energy wasted every year in shoes unsold, cancelled, destroyed and transported from faraway manufacturing units to their final destination markets.

The topic was recently revisited by a doctorate student in Europe, who found some very interesting comparisons between mass produced and customised footwear in terms of energy usage and carbon footprint. Anyone reading the numbers would be surprised at the amount of energy that could be saved and emissions reduced if we only produced what consumers really wanted and in the right quantity. Moreover, short supply chains and production plants close to destination markets would also have a positive impact on the overall carbon footprint of the entire process. A widespread awareness of such a situation could perhaps become the single most powerful driver for a new era of MC in footwear. 🌱


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### BONTEX Taishan Mill



Bontex has built a state-of-the-art manufacturing facility at Taishan, Guangdong Province, incorporating many of the Bontex manufacturing guidelines into their daily operating principles. This facility is ISO 9001:2008 and ISO 14001 certified, and the statistical process controls to guarantee consistent quality time after time, point after point are governed by its manufacturing and laboratory staff, all of whom are SAIHA trained. This facility has a modern fuel-fired boiler for self-sufficiency with state-of-the-art air pollution controls. The Water treatment system is a 2-stage filtration solids removal and biological treatment system to ensure consistent water quality. This facility is large and has room for future expansion.

### BONTEX Yangzhou Mill



This facility located in Yangzhou, Jiangsu Province, a chemical and non-ferrous logistics area. Newly installed state-of-the-art spinning and needling equipment insure that the base web of this facility is unmatched for consistent basis weight and gauge control. Lanes preparation is ready to allow for vertical integration to keep costs in line. This facility can run with up to 100% recycled polyester based fibers but we also can blend unique fibers to achieve specific properties. In the future expansion is also possible at this facility.

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