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3D PRINTING FOR MARKETING AND ADVERTISEMENT INDUSTRY

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ABSTRACT: 3D printing provides a new dimension for the communication of value of products and services to the audience through concept modelling, which prevents ambiguity of design throughout the product life cycle for design, visualisation, verification and presentation purposes. It provides near identical model of the prelaunch product for the customer to touch and see, and even to test the product functionality. The models delivered actual shapes, colours and tactile finishing that Computer Aided Design (CAD) prints could not. This diversity of form generation allows it to merge with marketing and advertisement to gratify desires of the capricious population. This report serves to introduce how 3D printing is used in the marketing and advertisement industry by illustrating examples of 3D printing applications within the industry. The paper will draw examples based on personalised and commercial product marketing. There are however several key challenges, both technical and commercial, that have to be overcome before 3D printing can truly take flight. The paper will then discuss on the future of 3D printing in marketing and advertising and the steps required to overcome the challenges.

INTRODUCTION

Marketing and advertisement is about the communication of value of products and services to the audience (mainly customers) [1, 2]. Engineers and toolmakers communicate through Computer Aided Design (CAD), which unfortunately requires time for studying and visualising. This communication appeared to be less effective for the general population of whom, including the project approval executives, might not have knowledge on CAD design [3].

Studies have been conducted on the psychology of consumers, and results have proven that 3D products providing direct experience will have a positive impact in terms of consumer learning [4]. 3D printing provides a new dimension for communication through concept modelling, which prevents ambiguity of design throughout the product life cycle for design, visualisation, verification and presentation purposes. It provides near identical model of the prelaunch product for the customer to touch and see, and even to test the product functionality. The models delivered actual shapes, colours and tactile finishing that CAD prints could not [5]. This diversity of form generation allows it to merge with marketing and advertisement to gratify desires of the capricious population [6].

Recently, 3D printing, also known as Additive Manufacturing (AM), has been creating a lot of buzz in the news. With the first working 3D printer designed by Charles Hull in 1984 [7], the technology only became popular in the early 2010s [8]. Its success in its widely gained attention is due to the expiry of a patent describing the fused deposition modelling (FDM) technique (see Patent US 5121329 A) [9], but the spread has also definitely got to be attributed to its use in the marketing and advertisement industry.

Techniques of 3D printing are still advancing to offer better resolution, more choices of materials and larger dimension of products to better suit the requirements of the marketing and advertisement industry [5]. For example, PolyJet Technology is able to produce multiple materials, and offers enriched fine details and smooth surfaces of models. In order to suit increasing demand

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in creating multi-colour objects, the Objet500 Connex3 was developed, which lets the user incorporate as many as 46 colours into one prototype [10]. Applications involved prelaunch models produced used in photos for marketing collaterals (brochures, flyers or websites). 3D printing can also be used in the design of packaging and displays to make the products more salient. On the other hand, FDM may be implemented if the durability and feels of the final product were desired, especially for functional parts.

Several organisations have begun to implement this technology in their marketing and advertisement efforts. Most approaches involved personalised product marketing and commercial product marketing to deliver unique brand experiences to the customers. This report serves to introduce how 3D printing is used in the marketing and advertisement industry to achieve the above mentioned goals.

PERSONALISED PRODUCT MARKETING

Personalised marketing refers to targeting a product or service to an individual customer. It is distinct from mass marketing, where a product is designed to appeal to the mass public, and from niche marketing, where a product is designed to appeal to a targeted audience. Personalisation gives customers an intimate sense of engagement, recognition and special. It is a unique way of reaching out to the customers on an individual basis, giving the customers unforgettable experiences and memories. Benefits of personalised marketing include, increasing conversions, improve customer retention, and makes marketing useful [6]. In this section, three examples of how personalised marketing is used to establish stronger company brands are described.

Coca Cola (Beverages Industry)

Coca Cola, a strong brand that delivers refreshing beverages, had effectively used 3D printing to create a buzz without reinventing its marketing strategy [11]. Coca Cola Israel was launching its new line of products – Coca Cola mini-sized bottles – and required an effective strategy to promote the new extension.

The company launched a competition where consumers could, through a Coke hand phone application, recreate their physical appearances. Lucky winners were then selected and would be presented with mini versions of themselves (mini-me's). The lucky winners were invited to the Israel factory, where they would have their full bodies scanned, followed by presented with a 3D printed representation of their mini-me's. In order to realise this, the company had created a 3D printing space, where the set-up of the 360 degrees scanners and 3D printers would be. In this promotion, the company promises to give their customers "a personal experience they will remember forever".

Muji (Consumer Products Industry)

In this example, MUJI, Japanese purveyor of no-brand quality goods, had partnered All Nippon Airways (ANA), a Japanese airline company, to promote "MUJI To Go", a range of MUJI products targeted at travelling customers. The products were curated based on the concept of "Good Travels with Good Products".

The promotion, a global campaign "MINI To Go", invited customers who have shopped at MUJI to bring receipts of their purchases to New York Times Building MUJI store to have their 3D photographs taken. The 3D data would be shared to the customers via hand phone applications and facebook. Participants would then be automatically entered for a chance to win one of the ten 3D printed figurines of themselves.

The concept was interesting and simple, if you want to travel from point A to point B, a full body 360 degrees scan of yourself can be performed before departure, and the 3D printed figurine of the scan data could be produced upon arrival. That is exactly what would happen to the grand winner. Out of the ten participants receiving 3D printed figurines, one of them would win a chance to fly on ANA, free, and receive 3D printed figurines of themselves upon arrival at their destination [12]. Through this promotion, "MUJI wants to send you on a quest to find your 3D printed self".

Belvita Biscuits (Pastry Industry)

Perhaps Belvita is not a brand known to many as much as the two examples described above, but that is precisely the point. A company in the biscuits business, it has also turned to using 3D printing technology as part of its marketing strategy.

The company ran a campaign to celebrate "morning wins" by using 3D printing to create personalised virtual and real trophies. The campaign invited customers to tweet about their mornings, and lucky winners will receive certificates and winner trophies – with a twist. The trophies would have personalised mini versions figurines of the winners on them. The company had set up a retail storefront on New York's Lower East Side that showcased the entire trophy making process. In the premise, winners would receive full body scan of themselves, and 3D printers were used to create small figurines. The trophies were then made and packed and sent to the customers, each customised with the figurine representation of the customers. In order to boost personalised marketing, winners were also invited to witness the trophy making process, to see mini versions of themselves made using 3D printers [13].

This example is extremely unique in that Belvita, a brand with much smaller market presence than Coca Cola, had used 3D printing to reinvent its marketing strategy. Belvita called its campaign "#MorningWin – Steady Energy, All Morning Long". If you win a trophy, it will indeed be a morning win.

COMMERCIAL PRODUCT MARKETING

Commercial product marketing involves brands producing actual product from custom made designs and 3D printed for customers. This allows customers to feel integrated with their own design and product. Mass customisation is now made possible through 3D scanning and printing technology at a cheaper cost and more flexible designs. The following section will show the selected examples of current industry with customer's involvement with 3D printed products [14].

Promotional Giveaway Items

The concept is to design and 3D print items that will promote the business. The giveaway items may be printed by the company to be distributed to customers, or the 3D CAD file may be available on websites for free downloads. While the former provides more interaction between businesses and customers, the latter is an advertisement avenue at minimal cost to the business [15]. These promotional giveaway items may carry the names of the companies, or information about new product launches, and hence serves as an effective marketing tool. Examples include keychain, phone cases, accessories or miniature representations of company products [16-20].

An excellent example of company product giveaway is Loft, a 3D software company which develops software for the furniture retail and interior design market. The company launched a direct marketing campaign called "Remember Loft?" to generate interest in both their 3D software as 3D printing itself. The campaign included customised 3D printed couches which are available in the Loft 3D software. In addition to couches, the company offered their customised 3D printed

versions of their customers' most popular products. The goal of the campaign was to 'get on the radar' with customers and the 3D printing campaign achieved this. According to the company, their email click ratios directly following the campaign tripled [21].

Fashion Industry

A very interesting application of 3D printing for direct marketing is in fashion. In one example, Victoria's Secret used 3D printed wings in its fashion show. Dubbed the merger of sexy lingerie with one the sexiest emerging technologies, it has definitely caught the attention of the mass media [22]. Besides this example, 3D printing has also been used for garments, accessories, shoes and even eyewear [23-27]. In fact, 3D printing has been gaining increasing interest in the catwalks, with established brands using it to offer unique customisations [28, 29].

Others

Other industries making their attempt using the limelight of 3D-printing and putting them into new business opportunity include collectibles [30, 31], chocolates[32], automotive [33], vending machines (Dreambox [34]), online gift shops [19, 35], 3D printed watches [36], restaurants [37], Motorola [38], Business Name Card agency [39, 40] and accessories design firm [38].

FUTURE OF 3D PRINTING IN MARKETING AND ADVERTISING

It is clear that 3D printing has a very bright future in the marketing and advertisement industry. However, there are several key challenges, both technical and commercial, and those have to be overcome before 3D printing can truly take flight.

Looking from the technical point of view, 3D printing is currently limited by its speed. The fastest consumer based 3D printer in the market, as claimed by the manufacturer, is the Ultimaker 2 which is only able to print at a maximum speed of 30 – 300mm/s [41]. Based on the high end of that scale, a simple 50mm cube sized souvenir will take more than a couple of hours to print. This, while acceptable from a prototyping house viewpoint, will be too slow for direct marketing purposes. Progress in this field includes research done in the Vienna University of Technology for speed 3D printing, where they are able to print at 5m/s using Two Photon Polymerization (TPP) [42]. Another research in high speed 3D printing is the High Speed Sintering (HSS), which is a new AM process invented at and patented by Loughborough University in the UK [43].

Another technical limiting factor in 3D printing is the materials available to the user, while there has been progress made in printing functional metallic components, this tends to be the realm of high end metal powder type 3D printers. Most small scale 3D printers, which would be more accessible to more marketing and advertising companies, are based on the fused filament fabrication (FFF), which tend to print using Polylactic Acid (PLA) and the products that are produced by this method tend to be more for form and fit rather than function. This may be acceptable for display pieces, but would not be good for functional souvenirs.

For 3D printers to make its way into mainstream marketing and advertising, step changes need to be made. One major step change that is currently occurring already is the entry into the market by large multi-national corporations like Dell with their MakerBot system [44]. Another change that is currently in motion and will come into fruition in a couple of years is the greatly reduced price of entry level 3D printers. An example of an early mover in this market segment is Pirate 3D with their Buccaneer system [45].

This is the key to the success of marketing and advertising as it will make the 3D printer ubiquitous. Strong penetration of the technology into the consumer market will allow direct marketing and mass customisation. Advertising campaigns can consist of customers customising a part online and receiving the 3D printable file to be printed in their own homes. This will increase

the brand visibility of the company at relatively reduced costs compared to traditional modes of marketing such as sample giveaways, print and television advertisements.

If the speed issue can be resolved, a concept like mold-a-rama, an automatic miniature plastic factory based on the concept of injection molding [46], could be realised using 3D printing instead. This will enable direct and instant customisation of marketing artifacts at vending machine style stations, greatly increasing the reach of the company, while reducing inventory cost.

CONCLUSION

In conclusion, 3D printing has already made its foray into the marketing and advertisement industry with impressive results so far. However, there exist limitations that prevent it from truly taking flight. Should these issues be addressed, 3D printing can truly revolutionise the marketing and advertisement industry, with potential applications that have not yet even been imagined.

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