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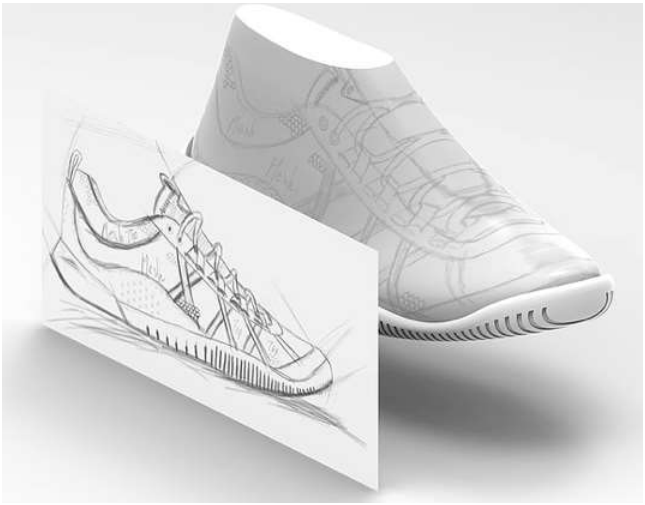
Systems for integration of Footwear design processes: overview of most innovative software

Graphic Software

Recently a raising number of designers started to use graphic software: the most famous are Adobe Illustrator and Adobe Photoshop. Thanks to Illustrator, the design becomes a vector file and therefore easily editable. With Photoshop it is possible to scan materials (i.e., leather or textiles) and apply all of the textures in order to realize the so-called rendering. The rendering is a real-life design which, other than showing the style lines, it also simulates the final appearance the shoe will have once made from the materials.

Introduction of CAD 3D Software in Footwear design

Additionally, many companies have started to use CAD 3D software for designing fashion shoes: it is famous the case of Tempe (Zara) where a group of more than 50 footwear designers has started to realize the products' design using Icad3d+. The very same is happening within the German group Deichmann which has also adopted Icad3d+, as well as the American group Wolverine which has chosen Romans CAD. The main advantage of realizing a 3D design is linked to the possibility of communicating a more efficient and precise manner with the producer, thus avoiding different interpretation which could lead to revisions and modifications (in other words, to additional production time and costs).
The adoption of 3D software for design has reached not only fast-fashion companies but also luxury brands such as Hermes, which has adopted the software Romans CAD to coordinate the work between the designer and the pattern makers within the company. In this case, the process is organized in a different manner: the pattern makers within the Italian companies receive the French designers' ideas in a traditional way and they realize 3D design before starting the real prototyping phase.
Besides the already mentioned Romans and Icad3d+, there are other software for 3D design used within the footwear sector, such as Shomaster e Procam. All software that allows not only to realise the 3D design of the shoe but also, starting from it, to create the technical model, i.e., the instructions for cutting the pieces of the shoe upper and lining.
At the moment, there are different software for 3D design which present many differences in terms of technological possibilities and costs. A Rhino's license – one of the most common – costs less than a thousand euros, there are Rhino plug-ins that allow you to automate many



of the operations required to design a shoe or sole. For a full licence of 3D footwear CADs on the other hand (such as Shoemaster, Romans and Icad3D+), 10,000 Euro is not enough. Additionally, it is possible to use free software to realize 3D design.
Clearly, adopting this typology of software it is only possible to create a 3D design and, often, it takes a long time to realize certain shoe's parts (for example laces or plugs of a tank sole), while the specialised software has the capability to create footwear more efficiently and easily. Moreover, with free software, it will unlikely be possible to send the design information to the ones who perform the technical production (either to cut the upper pieces or to make the mould of a sole).
In many companies this separation between 3D design and technical production does not seems to represent a problematic. Indeed, frequently, big companies dedicated to design creation are not involved in the technical development of the product and the company itself does not favour the use of integrated systems.
Together with 3D design it must not be forgotten the introduction of 3D printing, which has many different scopes: one of them is the realization of a shoe's 3D prototype. The 3D printers currently available on the market have not the capability to realize shoes maintaining the same performances of the traditional production. Nonetheless, they are able of realizing maquette for the aesthetic evaluation of the footwear and, in certain cases, for a first fit evaluation. In addition, starting from a 3D design, it is possible to use sophisticated rendering systems and realize images very similar to real-life photographs. This fact opens the possibility to create online catalogues, e-commers and interactive showcases within the shops, together with many other applications in which the 3D design substitutes the physical product.

The role of digitalization in the Footwear sector

In moder times, it is necessary to be able to rapidly communicate with clients and suppliers all over the world and which, as it happened during Covid-19 pandemic, do not have the possibility to physically move. In this context, the digital culture is indispensable for improving the efficiency and cutting the decision-making times. Nowadays, it is vital for the companies to guarantee that at each of their internal level there is familiarity with technology and, so, the training programmes must take it into account. Regarding the ones dealing directly with the products there are many issues: graphic programmes, videos and presentations, software for CAD engineering, 3D scanning and modelling, material's digitalization, rendering and animation, software for cataloguing and managing the product's life cycle. Maybe, the current challenge is to understand when technology remains a tool and when it becomes the end, as

it was underlined by Claudio Marenzi during the meeting “The Future of the Fashion Industry”. In this occasion Marenzi claimed that even if NFT and the Metaverse are gaining increasing success, people will not wear pixels in the future. This provocative affirmation was not intended to dismiss the eventuality of the digital asset business, but, overall, it wanted to bring the attention back to the central issue, which is to train youthful people to “make” a product.

In conclusion, today, fashion costumers are becoming increasingly used to deal with virtual commercial system and, thus, the virtual and concrete shopping realities seem to present leas and less differences. The speed of their adaptation has not been matched with the one of the footwear companies which are currently struggling in incorporating innovative and technological instruments in their designing and production processes. Fortunately, it appears that this is changing too. In an ever changing and interconnected world, where it is fundamental for a business to reach the vastest group of consumers, footwear companies must adapt and include the best possible tools in their daily activities, which means improving the adoption of technological and digital instruments in their working environment.