

CLO 3D DATABASE FOR DIGITAL FASHION DESIGN AND PRODUCTION METHOD

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Abstract

Several factors such as: 1) the need to offer new products, 2) it takes time to develop a good design, 3) the constant changes in fabric inventory, 4) it is mandatory to meet production costs, 5) it is mandatory to meet the minimum quantity of production, 6) the need to reproduce items that sell well, and 7) fashion is a rotating trend; are the factors that influence the importance of having 3D database for clothing design and production process. This article was written, in collaboration with Lovadova, a clothing brand with remnant fabrics concept. Database was co-created and studied using Clo3D, with the aim to produce general guideline in using clothing database. Based on analysis and observations on Lovadova data for the past 10 years (product line, sales data, return data, R&D process, Lovadova workshop visits), it was found that there are 5 design methods of using database. Advantages of using database in designing clothes are: 1) reuse, design selected data in a short time, 2) efficiency for R&D and production. Behind the advantages, there are also many challenges and difficulties that must also be completed in order for the database to be effectively used. In the future, this digital method with Clo 3D, if used correctly, will be able to support the business process of fashion e-commerce clothing more quickly and efficiently.

Keywords: Database, Digital, Fashion, Design, Production

1 INTRODUCTION

In the Making Indonesia 4.0 roadmap, one of the five sectors that will pioneer the implementation of industry 4.0 is the textile and clothing industry. Currently, Indonesia is ranked 15th in the world with revenue in the fashion segment hovering around US\$4,792 million in 2019. This revenue is expected to experience an annual increase of 25%, the market volume is around US\$ 11,708 million by 2023. The largest segment was apparel with a market volume of US\$3,349 million in 2019.

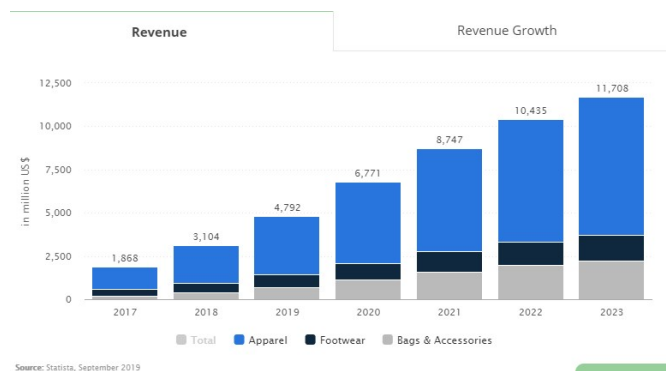


Figure 1. Indonesia Fashion Segment Revenue

The number of e-commerce platforms (both B2B, B2C, C2C), such as Zalora, Pomelo, Indonetnetwork, Bobobobo, and others also supports the fashion industry towards a more modern

and digital direction, but generally only limited to the way of sales (marketing and online product presentation). In terms of production, there are still many productions encountered in completely manual ways. There is advantages of using manual way, but with the competitiveness of this industry, the digital way is a gap to bring this industry more advanced and competitive.

2 METHODOLOGY

Virtual garment simulations have also been researched for a long time since 2005 (Volino, et al., 2005; Choi & Ko, 2005; Fontana, et al., 2005; Luo & Yuen, 2005). Fashion design with virtual technology combines the design process and clothing display, effectively optimizing the design process for clothing designers. In recent years, with the rapid development of computer technology, many software have been developed and applied in clothing production, including CLO3D software. Compared to the traditional design process, virtual 3D design makes it easier for users to realize clothing results in visual 3D form, instant modification, save time and cost, provide an effect that seems more vivid (Mu & Cao, 2015). There were 649 job vacancies in StyleCareers.com in 2016 that showed many digital competencies sought as job requirements in 7 fashion areas, including design and production. This indication gives a sign that in the future with the industrial era 4.0, digital capabilities will be more useful in supporting the fashion business (Wang, Brookshire, 2018).

3 FINDINGS AND DISCUSSION

3.1 Brand Partner Clothing Database

Lovadova is a clothing brand that has been operating since 2012 with the concept of using remnant fabrics. There is only one type of clothing size produced, namely one size which is intended for the size of Vietnamese and Indonesian women. The concept of remnants and one-size fabric does have advantages and disadvantages. The advantage is that the brand never reproduces clothes with the same fabric so there is always novelty in every collection; and it is enough to make one pattern because there is only one size and it is cheaper in capital and production. The downside is, because brands always buy new types of fabrics (never restock old fabrics), the pattern must always adjust the character of the fabric used, so that there are many adjustments to the pattern, both small and large. Another drawback is the difficulty of finding the right size for Indonesia and Vietnam. With retail prices ranging from the middle market, the production price must always be maintained so as not to exceed the cost that it should be. Production costs are most affected by the amount of the fabric used to produce one cloth. Making a pattern manually means that you can only find out the length of the fabric after the pattern is finished and cut. Meanwhile, through a software, fabric length can be easily estimated, so any design with fabric overuse can be adjusted immediately.

Women's clothing models are also evolving every day with new pattern and sewing techniques. To remain relevant to market demand, new samples must always be developed. Through a manual pattern, it is not uncommon that the samples do not match with the designs, thus wasting time and costs for sample revision. Meanwhile, through a software, there is a 3D avatar that can be made wearing a sample that is being worked on, so that any discrepancies can be immediately revised instantly.



Figure 2. Pattern Revision (Dress Length) & Avatar Preview Avatar using Clo 3D

Lovadova 3D database has only been developed as of 2019. During the past years, there are about 900-1000 sku that have been produced, but only with physical data (paper patterns), so every time it needs to be reused, the paper pattern must be re-searched or re-modified. Over time the pattern accumulates, is difficult to find, disappears, takes up space and spends time again recreating. For this reason, digital solution is considered better for work efficiency. Because it is not possible (limited time and resources) to make all the data, the 50 best SKUs are selected which are considered good in terms of sales, size match, return rate, quality, ease of production, production price, and selling price. The 50 data were digitally reconstructed so that there is a computer version of the 2D pattern (A4 ready to print) and 3D rendering using avatars with the standard size of the clothing model. By using a combination of these 50 digital data, as of 2019, all Lovadova's collections are designed to get more efficient results. Here are some examples:



Figure 3. Digital Database & Database Usage by Changing Clothing Model (Change Fabric, Change Pant Length & Hem Design)



Figure 4. Digital Database & Database Usage by Changing Clothing Model (Change Fabric, Add Button Details on the Front Design)



DATABASE (OLD SKU)

→ NEW SKU

Figure 5. Digital Database & Database Usage by Changing Clothing Model (Change Fabric only)

3.2 Database Usage Method

There are 5 methods in using database:

Table 1. Redesign Works with Database

No.	Types of Database	Time & Effort	Activities
1	Creating new database	High	Re-measure the finished product, fabric character assessment, create 2D patterns, create 3D visuals with avatars, make A4 print-ready patterns, provide catalog photos for data comparison between virtual and actual product
2	Use existing database: change clothing size and model	Moderate – high	Change bust/waist/hip size from A size to B size Change clothing model from straight to ruffle cut
3	Use existing database: add/ remove clothing parts	Moderate – Low	Change parts of a cloth (sleeve, button, accessories, collar, pocket, etc)
4	Use existing database: change clothing lengths	Low	Add/ cut lengths of a cloth
5	Use existing database: change fabrics	Low	No changes in pattern and size, only change the fabric and the 3D visuals

4 CONCLUSION

There are several advantages of using database in clothing design and production:

1. Can reuse, choose good data (best-selling) to design new ones quickly
2. Efficiency in R&D and production
3. Digital database is easy to store, search, and reuse; does not take up space
4. More helpful for items with complicated patterns
5. Helps better for user who have hands-on experience before with manual pattern and sample making

Behind the advantages, there are several challenges and disadvantages that must be solved to compile a good database:

1. It takes a lot of time to create an entire database from scratch (especially if there are too many product lines);
2. Manual data (paper patterns) tend to be more difficult to be measured and takes much space
3. Requires experts who understand special software to create digital database and 3D avatar previews, as well as those who have knowledge in pattern and sewing skills.
4. Less helpful for basic (timeless) items
5. Each fabric has different character, elasticity, thickness, texture, which is quite difficult to portray without actual tactile assessment. With too many or unknown fabric compositions (remnant fabrics), actual samples may be different than the avatar preview
6. Unable to replace the tactile experience of manual fitting and size fitness

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