International Journal of Innovative Research in Engineering
Volume 7, Issue 3 (May - June 2026), PP: 55-58
https://www.doi.org/10.59256/ijire.20260703006
www.theijire.com
ISSN No: 2582-8746

Digital Platforms for Textile Design Innovations Community: - review

Divya Bodhankar[1], Nikhila Rane[2]
[1]Msc Student of Fashion Design and Textile, SNDT Women's University, Mumbai, Maharashtra, India.
[2]Assistant Professor of PG Department of Textile Science and Apparel Design, SNDT Women's University, Mumbai, Maharashtra, India.

How to cite this paper:
Divya Bodhankar[1], Nikhila Rane[2], "Digital Platforms for Textile Design Innovations Community: - review", IJIRE-V7I3-55-58.

Abstract: *The textile and fashion industry has a undergone a significant transformation with the integration of digital technologies and computer aided design and also (CAD) systems traditionally, process such as a textile patterns creation, garment construction and fabric printing were the carried out manually requiring substantial time, and also efforts material effort and material also resources however the adoption of the digital design tools has a the enhanced digital textile design software improves efficiency, accuracy and also the flexibility in the fashion industry. Tools like Adobe Illustrator, Adobe Photoshop, CLO 3D, and others enable designers to create patterns, simulate garments and also visualize designs before production, reduction, reducing fabric waste and physical sampling. These technologies also support sustainable practices through better resource use and virtual experimentation. However, the challenges such as high costs, technical complexity, and the required training remain these tools enhanced the innovation, productivity, and sustainability, with advancements in AI and 3D technology expected to further transform the industry.*

I.INTRODUCTION

The textile and fashion industry has a experience a significant transformation with the rapid adoption of digital technologies and also the computer aided design (CAD) system Traditionally the textile patterns, and garment construction and fabric printing were the carrier out manually using sketches hand drawing techniques and repeated physical sampling this process required considerable time, effort and also materials resources often leading to the increasing production costs and delays However the introduction of digital platform has revolutionized the design and production workflow by improving accuracy, efficiency and flexibility Modern software tools allow designers to create digital patterns simulate garments in virtual environments, and visualize final output before the manufacturing thereby reducing the dependency on physical prototypes and minimizing the fabric western (Afrin et al., 2025). Furthermore these digital systems contribute to Sustainable design practices by optimising resources utilization and enabling virtual experimentation which reduces environmental impact (Glogar et al.). This digital has speed precision and sustainability although the challenges like high cost technical complexity and the need for training still exist in their adoption.

Adobe Illustrator

The Adobe illustrator is a vector based graphic design software widely used in the textile and fashion design for creating the motifs repeat patterns and technical illustration it's a ability to the generate scalable graphics without loss of quality makes it particularly valuable in the Textile application where designs need to be resized or adapted for different fabric surface (Han & Yu,). A major advantage of illustration is it's high precision and scalability allowing designers to produce professional efficiently it also offers advanced tools for color control layering and pattern development which enhances creativity and workflow However the software also has disadvantages including a steep learning curve for beginners and the requirements of a paid subscription Additionally it mainly supports 2D design and which limits its use in the modern 3D garments visualization process.

Adobe Photoshop

Adobe Photoshop is a rester based image editing software commonly used for developing textile prints, surface textures and digital artwork. It enables designers to create visually rich and detailed designs using tools such as brushes, filters, and layer based editing (Onwuekwe et al.,). The main advantage of Photoshop is its ability to produce highly realistic textures and complex color effects making it ideal for digital textile printing it also integrated well with well with other software improving design flexibility However it has certain disadvantage, as pixel based images and may lose the quality when resized which can limit scalability Moreover the software can be complex for beginners and requires a paid license, making it less accessible for some users.

CLO 3D

The CLO 3D is an advanced 3D garments simulation software that allows designers to create virtual garments and also analyze fabric also behaviour in a realistic environment. It helps converts 2D patterns into 3D is models and simulates draping the stretch, and also movement (Hu, 2026). One of the most important key advantages of the CLO 3D is its ability to reduce the need for physical samples, saving both time and also cost while improving design accuracy it also enhances communication through realistic visualization. However this disadvantage includes the requirements of a high performance computer system and technical expertise to operate effectively. Additionally, the software is expensive which may limit its use among students and also small scale designers.

Browzwear VStitcher

The browser VSsticher is a professional 3D design software used for garment simulation and also digital product designers to test garment fit, fabric drape, and also movement before production (Schiller et al.,). In the major advantages of this software is that it's reduces produces production errors and enhances collaboration by allowing teams to share digital prototypes it also saves time and cost by the minimizing physical sampling and the However the software has the disadvantage such as a complexity in usage the need for proper training and high system requirements it's cost also barrier for the beginners and also students.

TUKAcad

The TUKAcad is a CAD software used for the patterns making and also grading or marker planing in the apparel industry it improves and optimizes fabric usage through efficient layout planning (Pandey & Kumar,). The TUKAcad is its precision and efficiency which helps reduce fabric waste and improve productivity. It requires technical training and also knowledge which may be challenging for beginners. Additionally the software is not free making it less accessible to small scale users.

CorelDRAW

The CorelDRAW is a vector graphic design software used for textile prints, illustration and also layout design. It is known for its user-friendly interface making it suitable for both beginners and professionals (Onwuekwe et al.,). In the CorelDRAW is its ease of use and flexibility, allowing designers to create high quality designs efficiently. It also supports multiple file formats for production use However, it is a paid software and also requires a good system for smooth performance some advantages tools may also require time to learn.

Pattern Smith CAD

The patternsmith CAD is the most used for digital pattern making and also garment development helping designers improve the accuracy and efficiency in production (Edae et al., 2023). Its is speed and precision, which reduces manual effort and also errors in pattern creation. However the software requires technical expertise and proper training it is also less commonly used compared to other CAD tools, which may limit its industry relevance.

Valentina

In the valentina is the open source patterns making software used for the creating measurement based digital patterns it is especially useful for the students and small designers due to its free availability (Valentina Project, 2023). The key advantages is cost effectiveness along with the accurate pattern drafting capabilities The it's lacks advanced features available in professional software and may not be suitable for large scale industrial production it's interface can also be less user friendly.

Turtle Stitch

The trurtlestitch is a web based embroidery platform that the integrates coding and with the textile design, allowing users to create embroidery patterns using this programming logic (Mayr-Stalder et al.,). The TurtleStitch is its innovative approach, combining coding TurtleStitch is its innovative approaching coding and design, which is enhanced creativity and learning. However it has limitations in professional use as it lacks of the industrial advantage and features is mainly suitable for the education purpose.

Lectra Modaris

The lectra Modaris is a professional CAD software used for pattern making grading and also the production planing in the fashion industry (Edae et al., 2023). It's helps the tools and instry level accuracy which improve efficiency and the reduce production ereors. The software is expensive and requires proper training and technical skills in the making it less accessible for beginners and also the small businesses.

II.CONCLUSION

The Digital platform have significantly transformed textile and fashion design by improving efficiency accuracy and also the creativity each software offers important advantages such as the precision, realistic visualization and

sustainability support while also presenting disadvantage complexity and technical requirements or the tools like Adobe illustrator and Photoshop enhance design creation while CLO 3D and VStitcher enable advanced virtual simulation and pattern making software such as a TUKAcad, Valentina, and Lectra Modaris improves production efficiency and also reduces waste. Therefore, despite certain limitations,digital technologies continue to play the a crucial role in shaping the future of textile design, promoting innovation, sustainability, and efficiency in the industry.

Advantages of Digital Textile Design Software

In a Digital textile design software such as a Adobe illustrator, Adobe, photoshop, CLO 3D, Browzwear VSticher, TUKAcad, CorelDRAW, PatternSmith CAD, Valentina, TurtleStitch, and also Lectra Modaris has a greatly improved the textile industry. These tools increase accuracy and reduce errors in design and pattern making they also save time by allowing quick editing and faster production. 3D software helps in virtual garments testing, reducing material waste and also the cost. In addition, these platforms enhanced creativity and also support easy collaboration, leading to the better productivity and sustainable design practices.

Disadvantages of Digital Textile Design Software

Despite their the advantages, these software tools have in some limitations. Many programs or require paid subscriptions, making them expensive for students and small designers. They also have a steep learning curve and require technical skills some software needs and high performance systems, especially 3D tools like CLO 3D and VStitcher. Additionally, vector software 3D features, while raster software may lose quality when resized open source tools like valentina may have the limited advances features. Overdependence on digital tools can also reduce traditional design skills.

Future Scope of Digital Textile Design Software

The future of digital textile design software is a very promising and also Technologies like a artificial intelligence machine learning, and also cloud computing will make these tools more efficient and user friendly 3D design software will the further reduce physical sampling and support sustainable production the growth of digital fashion, virtual platforms, and global collaboration will increase demand for these tools all digital software will continue to drive innovation, sustainability, and development in the textile and fashion industry.

References

1. Afrin, A., Arko, K. B., Afrin, S., & Ahmmed, M. M. (2025). The impact of CAD software solutions on efficiency and sustainability in textile and apparel manufacturing. Proceedings of the 2nd International Conference on Textile Science and Engineering (ICTSE 2025): Fashion innovation and sustainable apparel production (May 24, 2025, BUTEX, Dhaka, Bangladesh).
2. Ademtsu, J. T., Tsenuekpor, R. E. T., & Clottey, S. N. T. The role of fashion illustration as a communicative tool in design. Takoradi Technical University.
3. Aradhya, G. B., Lakshman, K., Ranjita, P. K., Selvakumar, P., Mohit, & Manjunath, T. C. The role of digital platforms in open innovation.
4. Browzwear. (2024). VStitcher product overview. https://browzwear.com
5. Brake, E. A., Kyosev, Y., & Rose, K. (n.d.). Investigation of textile pressure using VStitcher software.
6. Brake, E. A., Kyosev, Y., & Rose, K. (n.d.). Investigation of the tissue displacement through textile pressure on soft avatar in Browzwear's VStitcher software. Reutlingen Research Institute, Reutlingen University; TU Dresden.
7. CLO Virtual Fashion. (2024). CLO 3D software overview.
8. Eamen, R. A comparative analysis of CLO and Optitex 3D design software in the digital garment design process.
9. Edae, M. A., Li, G., & Negash, B. A. (2023). Research on implementing Lectra CAD/CAM software on the enhancement of apparel fashion design training for TVET polytechnic colleges in Ethiopia. Journal of Emerging Technologies and Innovative Research (JETIR), 10(3).
10. Glogar, M., Petrak, S., & Mahnič Naglić, M. Digital technologies in the sustainable design and development of textiles and clothing—A literature review. University of Zagreb, Faculty of Textile Technology.
11. Han, S., & Yu, S. Application of digital technology in the design of textile products. Wuhan Textile University; HuBei Water Resource Technical College.
12. Hazra, S. Fashion illustration: Scope of manual and digital platform. Amity University.
13. Hu, C. (2026). Personalized clothing design system enabled by digital textile manufacturing. Textile & Leather Review. https://doi.org/10.31881/TLR.2026.120
14. Indrie, L., Diaz-García, P., Kazlacheva, Z., Montava, I., & Ilieva, J. The use of CAD/CAM for textile designs and fabrics. Applied Researches in Technics, Technologies and Education.
15. İşgören, A. N., Bükme, E., & Çankaya, Ş. (2024). Women's clothing collection that comes to life in the virtual world. Motif Akademi Halkbilimi Dergisi, 17(48), 2393–2405. https://doi.org/10.12981/mahder.1526312
16. Jankoska, M. Application of CAD methods in 3D clothing design. https://doi.org/10.5937/tekstind2004031
17. Liu, K., Zeng, X., Tao, X., & Bruniaux, P. (2019). Associate design of fashion sketch and pattern. IEEE Access, 7, 1–15. https://doi.org/10.1109/ACCESS.2019.2906261
18. Lectra. (2023). Modaris: Pattern making software. https://www.lectra.com
19. Mandal, P. K. A study on the importance of fashion illustration in design education for apparel designers. Footwear Design & Development Institute.
20. Mayr-Stalder, A., Wolz, U., & Auschauer, M. Programming embroidery with TurtleStitch. TurtleStitch.
21. Mutmainnah, T., Marniati, M., Sumbawati, M. S., & Suharti, R. (2025). The use of fashion design applications as a medium for artistic creation virtually in the fashion and textile design department. Journal of Information Systems Engineering and Management,

10(32s). https://www.jisem-journal.com/
22. Noor, F., Deepshikha, & Tarannum, S. Recent innovations in smart textiles and the role of AI in textile industry. In Proceedings of the 8th International Conference on Technical Textiles and Nonwovens.
23. Onwuekwe, C., Ezeemo, U., & Nnoli, B. I. Exploring Adobe Photoshop and CorelDraw applications in enhancing imagery for screen printing on T-shirts.
24. Pandey, R., & Kumar, V. Integration of CAD technology for fast and customized production of apparels.
25. Sayem, A. S. M., Kennon, R., & Clarke, N. (2010). 3D CAD systems for the clothing industry.
26. Schiller, M., Flohr, S., Delmas, J. M., Krüger, A., Miene, A.-M., Zimmermann, P., Wolf, L., Seffers, M., Ruchay-Drammeh, M.-S., Reinhardt, U., & Sabantina, L. Evaluating material parameter influence on drapability using VStitcher.
27. Singh, R. K. Role of illustration in advertising. Amity School of Fine Arts, Amity University.
28. TurtleStitch. (2023). TurtleStitch embroidery platform. https://www.turtlestitch.org
29. Valentina Project. (2023). Valentina pattern making software documentation. https://valentina-project.org
30. Zhou, G., & Bai, G. (2024). Innovative research on illustration design integrating color science and image processing technology.