

Digital transformation in design and the impact of modern tools and technologies

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Abstract. Design is undergoing a profound transformation, driven by the rapid evolution of digital tools and technologies. This “digital transformation” is impacting almost every aspect of the design landscape, from the way humans ideate and collaborate to the tools humans use and the products create. Powerful software like Figma, Sketch, and Adobe XD are revolutionizing design workflows. These tools offer collaborative features, real-time prototyping, and integrations with other platforms, fostering agility and efficiency. In this case digital fashion, as a new field of design based on the use of 3D technologies in the processes of designing, visualizing, distributing, and marketing products, is becoming an integral part of the practice of contemporary digital transformation spreading. The purpose of the article is to analyze the trajectory of the evolution of digital transformation and characterize its impact on the transformative processes of culture. The methodological basis of the study is a systematic approach to analyzing the formation of the phenomenon of digital transformation using a historiographical analysis of the development of tools for digitalizing. The material for the historiographical and cultural analysis is a wide range of sources from scientometric databases. The process of formation and development of digital transformation is represented by three stages. For the first time, the markers characterizing the stages of digital transformation development are identified, which are the socio-technical indicators of the digital platform. Digitalization in this paper is considered as a transformation that leads to the expansion of the influence of the digital system on its own functionality and on the socio-cultural sphere. The processes of digitalization are presented in the form of internal and external professional factors in the form of hardware platform, software, workflows, operating models, competencies and acquired skills of the new generation of designers. The technical and sociocultural perspective of digitalization depends on internal sociotechnical factors and is determined by the scale of modelling the virtual social environment for installation. Understanding the peculiarities of the formation, history of development and socio-cultural role of digital transformation in design will help to increase the reliability of the assessment of its contribution to the sustainable development of culture.

Keywords: digital transformation, stages of development, socio-technical system, techno-socio-cultural perspective.

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INTRODUCTION

When talking about digitalisation and digital technologies, it is important to understand what lies beneath these concepts. Digitalisation can be defined as the introduction, dissemination and use of digital technologies in areas of human life. Digitalisation is redefining approaches to education, creativity and project work on a global level. Digital technologies should be understood as one of the tools in design activities in contemporary art, as well as an area for the creation of intangible virtual products.

In design and project activities, digital technologies contribute to the development of innovation, generation of new non-standard ideas.

Nowadays, almost any design project is either digital or a media product. The digitalisation of processes and the integration of innovative technologies into design projects has significantly increased the quality and diversity of design developments and applications. Nano art, which is a synthesis of modern art and science, is still developing. Most often "art" is based on images from super-sensitive microscopes, which is finalised on a computer by an artist or designer. Computer combinatorics, often used in the process of design students' project activities, is an effective way to study form formation (not only in graphics, but also in industrial object). Thanks to the use of the combinatorial method in 3D modelling, various forms of environmental and industrial design are created.

New areas of design have emerged, such as motion design, web design and interface development (UX/UI design). Today, more and more design projects involve the possibilities of virtual and augmented reality. Digital immersiveness as an object of study is perhaps the main trend in the educational environment and art of the last few years. The complete lockdown of the global pandemic period has more than ever actualised the interaction of the spheres of culture and education with digital technologies.

Speaking about digital technologies in

design, we observe the rapid development of digital art (digital art), based on the use of digital technologies, which results in artworks in digital format, more specifically, in the forms of software art, fractal, photorealistic rendering, VR/AR technologies and others. Modern development of visualisation by digital technologies allows the designer to construct virtual space, create media products, models and other in a synthesis of forms, formats, changing parameters and, in fact, having no limitations for creative search.

A number of advantages of digital technologies including:

- The ability to provide more information using minimal space;
- a non-standardised method of presenting textual and visual information;
- greater user engagement and better memorability of the information presented;
- the virtual absence of content restrictions.

The disadvantages include the following:

- The costliness of the technology and limited mass adoption;
- technical limitations and duration of preparation of necessary materials, including preparation of space for visualisation, work of a designer and other specialists in creating augmented/virtual reality and their support in the process of use;
- the need for the user to have applications and additional equipment.

Modern graphic design is impossible to imagine without digital tools. Software, online editors, tablets, and other gadgets greatly expand the capabilities of designers, allowing them to create real masterpieces.

One of the most popular graphic design tools is Adobe Photoshop. This versatile raster image editor is used for photo editing, photo compositing, drawing, and even 3D design. To work with vector graphics, designers often choose Adobe Illustrator. This editor is indispensable for creating logos, illustrations, fonts, and scalable graphic elements.

Adobe InDesign is used to create layouts for magazines, books, web pages and other print and digital publications. This tool

enables designers to accurately and efficiently place text and graphics on a page.

There are many other graphic design software tools available besides Adobe. Sketch and Figma are popular UX/UI design editors that allow you to create prototypes and mockups of websites and mobile applications. Affinity Designer is an affordable alternative to Illustrator that offers similar features at a lower price. GIMP and Krita are free and open source raster and vector image editors.

You don't always need expensive software to create high-quality graphics. There are plenty of online tools that allow designers to work anywhere, anytime. Canva is a simple online editor for creating graphics for social media, presentations, websites, and other projects. Visme and Piktochart are online tools for creating infographics, reports, and presentations. Fotor and Pixlr are online photo editors that offer a wide range of editing and retouching tools.

In addition to software and online tools, designers will also need other gadgets. Graphic tablets allow you to create digital drawings and sketches. A pen and tablet are convenient for navigating software and creating precise lines. 3D scanners allow you to create 3D models of real objects.

Let's consider the peculiarities of using modern digital tools in graphic design on the example of digital design in the fashion industry.

Digital fashion as a product and a part of culture has a unique ability to recognize the moods of the active part of society and turn them into its own trends. Due to its communicative properties as an expression of identity characteristics, fashion is responsible for reflecting the social status of an individual through the language of costume. Thanks to these social and personal characteristics, fashion has a significant impact on progress. And the stronger this influence is, the greater the contribution it can make to the sustainable development of society. But the risk of unsustainable development is that fashion's influence can be destructive, and in this case, it can push society to the peak of environmental problems. The two main trends of our time – the desire for environmental

safety and the transformation into a digital environment in search of more efficient functioning – can have a twofold impact on fashion. These trends can both enhance its homeostatic potential and increase its disruptive impact on sustainable development. This raises the issue of analyzing the trajectory of fashion development in search of an answer to the question of how the properties of fashion are changing under the influence of digitalization. Also relevant is the question of how to purposefully manage these changes and what impact digital fashion will have on sustainable development and the recent history of culture in general. Understanding the role of digital technologies in this transformation of the fashion system is the first step in solving this problem.

The importance of the topic of fashion industry transformation and the growing attention to it from the world scientific community is indicated by the focus of thematic issues of authoritative specialized journals. The International Journal of Fashion Design, Technology and Education (Taylor & Francis, 2023) pays great attention to the publication of specialized issues on topics related to digital fashion issues. The research projects and educational initiatives of the thematic issue on the future of fashion (The Future of Fashion, 2011) ranged from computer-aided design to the dissemination of information through social networks. Research materials revealed a high interest in the organization and management of fashion supply chains based on information technology (Taylor, 2011).

The next special issue of this journal is devoted to technology and sustainable fashion management (Sustainable Fashion, 2017). The articles in the issue show that fashion sustainability is influenced by the integration of sustainability practices with the supply chain of fashion products on a digital platform and communication between brands and customers both online through the Internet and offline through points of sale (Rinaldi & Bandinelli, 2017).

The third thematic issue of this journal is devoted to the review of digital innovations in modern fashion (Digital fashion

Innovation, 2022). The articles in this issue reflect the techno-historical spectrum of digital innovations in the fashion system. Starting with the first digital elements in the history of fashion, such as computer-aided design (CAD) systems, this spectrum is gradually shifting towards socio-cultural applications (Saem, et al., 2022).

The thematic issue "Fashion and the Moving Image" (2017) of the journal "Fashion Theory" (Taylor & Francis, 2023) is devoted to the transformation of "global style cultures" of the fashion system and their "fashion landscapes" (Radner & Karaminas, 2017). Dynamic images in fashion are associated with the attributes of digital fashion, in particular, with the virtual catwalk and virtual fitting rooms. "As fashion encounters an ever-increasing number of media platforms and their inevitable interpenetration, often referred to as 'convergence culture,' the fashion system is in a state of constant reconfiguration through its interaction with the moving image in particular" (Radner & Karaminas, 2017).

A special issue of the journal Fashion Practice (Taylor & Francis, 2023) is devoted to the analysis of the factors of evolution of the fashion industry in the process of its transformation - digitalization, sustainability and customer experience (Towards Transformation, 2022). It reflects industry systemic shifts in the entire fashion value chain. The pandemic has forced fashion firms to fundamentally change the status quo of the fashion system, rebuilding supply chains, inventory, distribution, retail channels, touch points, and services in a digital environment (Alexander & Rutter 2022).

The review of publications on the development of digital fashion is divided into two parts. The first article of the systematic review (Noris, et al., 2021) is devoted to the analysis of the current state of digital fashion research with an emphasis on research related to communications and marketing. The second article is devoted to the study of digital fashion "before and after communications and marketing" (Nobile, et al., 2021). The purpose of the work is to develop a structure and classification of

digital fashion based on an overview of its current state. The social consequences of the transformation of the fashion system into digital fashion have not been studied sufficiently to identify the main factors of influence on the socio-cultural sphere, which requires further study. Interest in them will expand due to the growing interaction of fashion with digital media (Nobile, et al., 2021).

In the article (Park & Chun, 2023), contemporary fashion is considered as a gaming tool to meet the needs of self-expression and for emotional and social interaction in the digital space. It is shown that since game artifacts relate to contemporary culture, game paradigms can be applied to new cultural practices.

The article (Särmäkari, Vänskä, 2022) considers fashion designers 4.0 as cyborgs who develop clothing models using generative algorithms. The "cyber-physical fashion system 4.0" that emerges from the use of digital tools and algorithms entails the use of intelligent technologies and networks, as well as the convergence of the physical and digital levels.

In the article (Särmäkari, 2023), the phenomenon of digital fashion is examined on the example of two pioneering companies in this field - Atacac and The Fabricant. It is believed that digital fashion can become an integral part of fashion design practice and business due to lower labor, material, logistics, and time costs (Särmäkari, 2023).

The analysis of the publications under consideration shows that among their growing flow, caused by the relevance of the topic, the largest part is made up of materials devoted to the technological features of digitalization of the links of the fashion product creation and marketing chain. Much less has been published on the impact of digital fashion on the socio-cultural sphere. The trajectory of digital fashion development, starting with the digitalization of routine operations and ending with the use of artificial intelligence in design processes, has not been considered. Therefore, these problems are new relevant topics for research.

The purpose of the study is to

characterize the process of formation, the trajectory of evolution of digital fashion and its impact on the transformation processes of culture.

Understanding the peculiarities of the formation, history of development and socio-cultural role of digital fashion will help to increase the reliability of the assessment of its contribution to the sustainable development of culture.

RESULTS

Under the influence of digitalization, the objects of the graphic design industry are evolving into sociotechnical systems, within which the study of digital innovations in the industry involves the analysis of social and technological factors (Hardabkhadze et al., 2023). To determine the features of the process of formation and the trajectory of evolution of digital fashion, a systematic approach to the analysis of its development was carried out. It combines the results of a historiographical analysis of the development of tools for the digitalization of graphic design in the area of fashion and a cultural analysis of the formation of its socio-cultural characteristics. These types of analysis are based on the materials of scientific periodicals using the results of content analysis of thematic issues of authoritative fashion journals, as well as research and review articles from the Scopus and Web of Science Core Collection databases.

In addition to a wide range of sources from scientometric databases, five journals were selected for content analysis:

“The International Journal of Fashion Design, Technology and Education” publishes interdisciplinary research on fashion design, fashion production and fashion education (<https://www.tandfonline.com/journals/tfdt20>).

Three thematic issues of this journal were selected for analysis:

- “The Future of Fashion” (2011);
- issue “Technologies and Management of Sustainable Fashion” (Sustainable Fashion. 2017);
- issue “Digital innovations in modern fashion” (Digital fashion Innovation, 2022).

“Fashion Theory journal” publishes research on fashion as a cultural construction of embodied identity (<https://www.tandfonline.com/journals/rfft20>)

The thematic issue “Fashion and the Moving Image” (2017) was used for the analysis.

“The Journal of Global Fashion Marketing” publishes research on global fashion, design, trends, and marketing (<https://www.tandfonline.com/journals/rgfm20>).

The material of the review article “Digital Fashion: A Systematic Review of the Literature. A look at marketing and communications” (Noris, et al., 2021).

“Fashion Practice journal” publishes research on practices, theories and innovations in the fashion industry. (<https://www.tandfonline.com/journals/rffp20>)

The thematic issue “Evolution of the fashion industry in the process of its transformation - digitalization, sustainability and customer experience” (Towards Transformation, 2022) was used.

“Computer-Aided Design and Applications” is the world's leading journal in the field of CAD, which publishes articles in both traditional areas and emerging fields of the discipline with a special emphasis on practical applications (<https://www.cad-journal.net/about.html>). The content of the section “Traditional and Emerging Topics” (<https://www.cad-journal.net/topics.html>) was used for the analysis.

The initial content analysis is aimed at forming a historiography of the gradual expansion of the digital functionality of the fashion industry.

The course of the fashion industry digitalization processes can be seen as the preparation of a technological platform for the formation and implementation of the digital fashion concept. Despite the absence of clear time limits, the process of forming digital fashion as an independent concept can be reflected in three stages: the initial stage, which reflects the process of digital fashion's origin, the stage of sustainable development, characterized by the maturation of the main

functionality, and the stage of extended virtualization, which involves the merger of digital fashion with the virtual world of the digital meta-universe.

The first works on digitalization and computer-aided design of clothing models began to be published at the end of the last century along with the development of graphic editors and CAD-CAM systems. But systematic publications of the first two stages appeared later and focused on technological advances. Technological leadership is stronger at the initial stage of forming the concept of digital fashion, the boundaries of which can be defined by the interval from 2010 to 2019. It is noteworthy that the leading journal in the field of computer-aided design systems “Computer-Aided Design and Applications” (2020), along with design theory, included augmented reality, additive manufacturing, and artificial intelligence in the traditional design topics. Therefore, these topics can be attributed to the initial period (2010-2019) of digital fashion. And this journal considers the use of computer-aided design systems in the fashion, art, and creative media industries to be an emerging topic, which connects these topics with the second stage of digital fashion formation (2019 to the present).

A marker of the transition to the second stage is the expansion of the use of 3D technologies from the design of digital models to the area of service and marketing using the digitalization of the human figure, avatars, scanners, and virtual fitting rooms. Virtual fitting of an avatar (parametric mannequin) involves building a digital model of a conditional figure of a typical physique, while a scanatar involves building a digital body scan copy of a real full-length human figure.

At the stage of sustainable development (2019-2022), the potential for the comprehensive impact of digitalization on the future of the fashion industry and the entire socio-cultural sector has become widely recognized. The digital fashion market was dominated by digital production and physical sales of smart clothing using smart textiles and devices with various service functions.

Further development focused on new models of individual digital production services based on the Internet of Things. The development of new services was stimulated by the use of artificial intelligence, which, along with industry 4.0 technologies, has stimulated the formation of the digital fashion concept. The transformation of the fashion industry into the Fashion Industry 4.0 creates conditions for the acceleration of social innovations that can compensate for the peroxide between technical, economic and socially significant innovations (Oliveira et al., 2022). The concept of digital fashion has been formed, in which the scope of 3D technologies has significantly expanded from the processes of designing and visualizing models to participating in stimulating the distribution of fashion products and marketing (Särmäkari, 2023). The conditional division of research topics by the areas of application and influence of digital fashion allowed us to form the following sequence of publications in descending order of their number: communication and marketing, design and production, culture and society (Sayem et al., 2022).

There is no universally recognized definition of digital fashion yet. To demonstrate the differences in definitions, some of them are listed below:

- “Digital fashion is a new field of fashion design based on 3D design that creates hyper-realistic, purely digital 3D simulations of clothing or digital models for physical samples.” “Digital fashion is both a tool and an alternative fashion culture that competes with the traditional fashion design profession” (Särmäkari, Vänskä, 2022);

- “Digital fashion is a new field in fashion design that differs from professional conventions and creates new strategies of jurisdiction and legitimation. In the increasingly virtual space and networked synergistic co-creation of digital fashion, the professional and material boundaries of designers become fluid, transforming the traditional figure of the fashion designer” (Särmäkari, 2023);

- “Digital fashion is the merging of the physical and the virtual, where 3D

technologies are used in the processes of design, product development, visualization, distribution, and marketing” (Särmäkari, 2023).

In the professional environment of fashion designers and media, graphic design in “digital fashion” refers to 3D technologies and practices that allow creating digital prototypes, models, and collections of fashionable clothes in digital form. It is believed that digital fashion can become an integral part of fashion design practice and business. Its production processes require less labor, materials, logistics, and time, which can lead to more sustainable business models (Särmäkari, 2023).

The empirical evidence published during these two periods on the impact of digitalization on the sustainability of the fashion system is insufficient to formulate effective models for managing transformation processes. Most of these studies do not take into account a comprehensive business view of the harmonization of digital technologies with current industry practices. “There is currently a lack of a holistic perspective, as the cultural aspects of digital fashion are not given enough attention. This is a serious limitation in light of the fact that fashion is one of the most cultural industries” (Casciani et al., 2022).

These problems have become an indicator of the formation of the third stage (2022 - present) in the development of digital fashion. Starting in 2022, the development of digital fashion is characterized by the intensification of the use of 3D technologies and game costume plots. This stage is also characterized by growing socialization, the merger of the real world with the virtual world, and the transfer of some actions to the digital space of the meta-universe. In the transition period between the second and third stages, the impact of digitalization on the social and cultural sphere is already increasing. As a result of the emergence of cyber-physical systems of “fashion 4.0” (Särmäkari, Vänskä 2022), the convergence of physical and digital levels has begun to exert innovative and disruptive pressure on the fashion design profession, which is

transforming along with technological and social changes. In the paper (Särmäkari & Vänskä 2022), which highlights the results of the fashion industry's adaptation to the principles of Industry 4.0, the authors describe the impact that these principles have had on fashion designers and the fashion system, which the article characterizes as “fashion 4.0”. “Cyborg Designer 4.0 moves between the physical and virtual worlds, between closed and open systems, and communicates through visual numerical representations” (Särmäkari & Vänskä 2022). The reciprocal impact of digitalization on the socio-cultural sphere causes “the humanization of computers and the computerization of people, which together form a cyborg designer, or fashion designer 4.0, with dynamic boundaries between the human body and the machine” (Särmäkari & Vänskä 2022). In other words, at the start of the transition to the stage of extended virtualization of digital fashion, the authors note the convergence of human and artificial intelligence, which entails significant changes in the lifestyle of both professional designers and the public. These trends are likely to intensify during the third period, as described in the next most recent paper by one of the authors of this article. In the article “Digital 3D Fashion Designers: The Case of Atacac and The Fabricant” (Särmäkari, 2023), the author speaks not of “fashion 4.0” but of “digital 3D fashion”, which reflects the beginning of the intensification of the use of three-dimensional processing algorithms and the maturation of the period of advanced virtualization.

The main components of digital fashion in the period of extended virtualization are digital clothing, smart electronic devices integrated into textiles, and clothing for the personalities of the digital human metaverse (Sayem et al., 2022).

If initially the digitalization of the fashion industry was aimed at optimizing the procedures of the fashion product creation chain with the help of digital design tools, “with the advent of the metaverse, a parallel world in virtual reality, a new horizon of digital fashion was opened” (Saem et al.,

2022). In this context, the term “metaverse” is perceived as a permanent virtual space of extended reality (XR) or real virtuality, in which people can interact with each other and with digital objects through their avatars (World economic forum, 2021). It is assumed that a person who enters the metaverse becomes a three-dimensional avatar (scanatar). It is up to the user to decide what his appearance will be and what he will represent. The fact that the individual forms his or her own habitual image opens up the functional possibilities of the metaverse for the realization of fashion trends based on the image of a person through his or her costume. This also expands the possibilities of building a virtual fashion image of an individual, allowing the person's taste and wishes to dominate in cooperation with the designer in the process of forming his or her image based on a prototype - an avatar. In this sense, perhaps, we should understand the phrase “with the advent of the metaverse, a new horizon of digital fashion has opened up” (Saem, et al., 2022). “Augmented reality” programs as a combination of augmented, virtual, and mixed reality have been mostly limited to a subset of video games and corporate applications. However, as games acquire the status of social experience platforms, there is a growing possibility that virtual game worlds can become means and channels of open creative expression.

In the course of further analysis of the texts of the sources, the author identified characteristic indicators of the concept of digital fashion, which made lists of “necessary” and “sufficient” indicators with their manifestations linked to the stages of development of digital fashion.

The “necessary indicators” include functions and tools to ensure automated design of clothing and the implementation of elements of individual design using virtual fittings based on avatar and scanner, as well as 3D modeling and marketing algorithms. These indicators are defined for the first two stages.

The “sufficient indicators” include systems for designing and managing the behavior of avatars, scanners, artificial

intelligence agents and other digital characters within the society of the digital meta-universe, as well as algorithms for imitating human style, culture and experience of wearing clothes.

It is assumed that even at the level of a creative studio or experimental laboratory, the functioning of the digital fashion concept will be realized on the basis of a sociotechnical system. This system consists of independent individuals, artificial intelligence agents, and a hardware and software platform. The sociotechnical capabilities of the digitalization of the fashion system are internal and external professional factors, such as the hardware platform, software, workflows, operating models, competencies, skills and knowledge of the new generation of fashion designers.

The techno-socio-cultural perspective of fashion digitalization depends on internal sociotechnical factors and is determined by the scale of modeling the virtual social environment for fashion installation. This scale of the virtual world can vary from the functions of tools for creating physical clothing to the culture of virtual reality in which fashion with its digital products for people, avatars or cyborgs is installed (Särmäkari, 2023).

One of the limitations of this approach is that the typical characteristics of the stages of digital fashion development are identified based on the analysis of a small number of works. However, the fact that the results of these works are based on big data analysis somewhat offsets this limitation.

An important tool in graphic design is the use of artificial intelligence tools. Here are the images created by Bing AI for the query “design for fashion show”.



Figure 1. Picture, formed by AI Bing for authors' request.
Source: AI Bing.



Figure 3. Picture, formed by AI Bing for authors' request.
Source: AI Bing.



Figure 2. Picture, formed by AI Bing for authors' request.
Source: AI Bing.

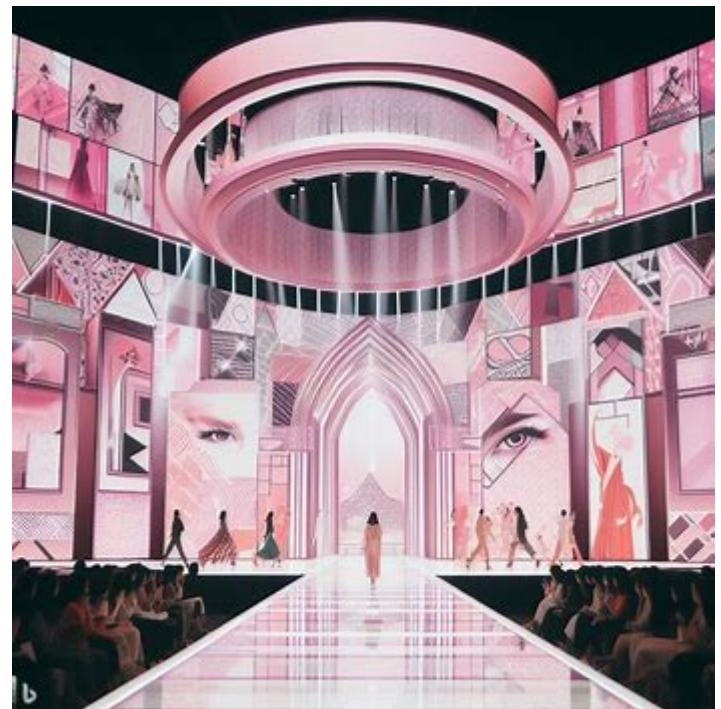


Figure 4. Picture, formed by AI Bing for authors' request.
Source: AI Bing.

CONCLUSIONS

The phenomenon of “digital transformation” has recently attracted the attention of researchers as a potential factor of influence on the transformative processes of culture. As a result of its digital transformation, for graphic design not only acquires the flexibility, functionality, and versatility that are characteristic of digital forms of creativity. In addition, it is also becoming part of the process of convergence of the physical and the virtual that has engulfed the socio-cultural sphere. In this study, the impact of the digital fashion system on the socio-cultural sphere is characterized by analyzing the changes it makes to the socio-professional adaptation of new generation graphic designers. Changes in the lifestyle of the public in the context of informatization are also analyzed. The study of the actual problem of the formation, development and impact of digital fashion on the socio-cultural sphere is realized taking into account two main trends of our time – the desire for environmental safety and the transformation of industries into the digital environment.

Since the specifics of the study of the transformational processes of modern culture require their consideration in historical and socio-cultural discourses, the results of the study are interpreted from the standpoint of techno-socio-cultural reality in terms of techno-socio-cultural perspectives.

Digitalization is considered in this paper as a transformation that leads to the expansion of the influence of the design system on its own functionality and on the socio-cultural sphere. The material for the historiographical analysis of the development of the tools of

design digitalization and the cultural analysis of the development of its socio-cultural characteristics is selected from the sources of scientometric databases with an emphasis on the context of thematic issues of five authoritative magazines (based on the case of fashion design).

From the content analysis, it was possible to identify the stages of formation and development of digital fashion, the markers of which are characteristic socio-technical indicators that define the boundaries of the stages. It is found that the socio-technical capabilities of the digitalization of the graphic design system are internal and external professional factors, such as hardware platform, software, work processes, operating models, competencies, skills and knowledge of the new generation of fashion designers. It is shown that the techno-socio-cultural perspective of fashion digitalization depends on internal sociotechnical factors and is determined by the scale of modeling the virtual social environment for fashion installation. The influence of digital fashion on the socio-cultural sphere is determined, which is manifested in the deformation of the boundaries of the professional activity of the new generation of fashion designers and in changing the lifestyle of the public.

Despite this limitation, the results obtained can contribute to a better understanding of the impact of contemporary graphic design capabilities on the transformative processes of culture.

The results of the work can provide important material for further study on the processes of transformation of the graphic design system and the socio-cultural sphere as a whole, considering new factors and trends.

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