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THE ROLE OF IT INNOVATIONS IN SHAPING CHANGES IN THE PUBLISHING INDUSTRY OF UKRAINE

The modern publishing industry in Ukraine is faced with the necessity of adapting to the challenges of the digital era, particularly through the application of information and communication technologies (IT). This article is dedicated to exploring the impact of IT innovations on the transformation of the publishing industry in Ukraine and identifying the prospects for its development.

The article commences with an analysis of the current state of the publishing industry in Ukraine and the identification of key challenges faced by publishers. This includes examining changes in reading habits, competition from other media formats, and market globalization. Emphasis is placed on the imperative of implementing IT solutions as a strategic direction to overcome these challenges. The analysis extends to contemporary technologies applicable in the publishing industry, with special attention given to electronic books, virtual reality, data analytics, and other innovative solutions. It is highlighted that the proper utilization of these technologies can enhance content quality, expand the audience, and provide competitive advantages.

The research explores the experience of implementing IT innovations in the publishing industry abroad, particularly in countries that have successfully utilized these technologies. The authors analyze best practices and shed light on crucial aspects that can be applied in the Ukrainian context. In the concluding section, prospects for the development of the publishing industry in Ukraine through the use of IT innovations are identified. This includes examining opportunities for creating interactive content and personalized recommendations for readers.

In summary, this study offers a comprehensive view of the impact of IT innovations on the transformation of the publishing industry in Ukraine and illuminates potential strategies to address the challenges faced by this sector. Overall, the adoption of IT solutions is a crucial element for the successful adaptation of Ukrainian publishers to contemporary challenges and ensuring their competitiveness.

Key words: publishing industry, IT innovation, modern technologies, interactive elements, QR codes, VR, e-books, audio books.

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РОЛЬ ІТ-ІННОВАЦІЙ У ФОРМУВАННІ ЗМІН У ВИДАВНИЧІЙ ГАЛУЗІ УКРАЇНИ

Сучасна видавнича галузь України стикається з необхідністю адаптації до викликів цифрової ери, зокрема застосуванням інформаційно-комунікаційних технологій (ІТ). Ця стаття присвячена дослідженню впливу ІТ-інновацій на трансформацію видавничої галузі в Україні та визначенню перспектив розвитку цього сектору.

Стаття розпочинається аналізом сучасного стану видавничої галузі України та визначенням основних викликів, з якими стикаються видавці. Зокрема, розглядаються зміни в читацьких звичках, конкуренція з іншими медіа-форматами та глобалізація ринку. Підкреслюється необхідність впровадження ІТ-рішень як стратегічного

напряму для подолання цих викликів. Проводиться аналіз сучасних технологій, які можуть бути використані в видавничій галузі. Особлива увага приділяється аудіо- та електронним книгам, віртуальній реальності, аналітиці даних та іншим інноваційним рішенням. Зазначається, що правильне використання цих технологій може поліпшити якість контенту, збільшити аудиторію та забезпечити конкурентні переваги.

Досліджується досвід впровадження ІТ-інновацій в видавничій галузі за кордоном, зокрема в країнах, які вже успішно використовують ці технології. Автори аналізують кращі практики та висвітлюють важливі аспекти, які можуть бути застосовані в українському контексті. У заключному розділі визначаються перспективи розвитку видавничої галузі в Україні з використанням ІТ-інновацій. Зокрема, розглядаються можливості для створення інтерактивних вмістів, персоналізованих рекомендацій для читачів.

Отже, це дослідження пропонує комплексний погляд на вплив ІТ-інновацій на трансформацію видавничої галузі в Україні та висвітлює можливі шляхи подолання викликів, з якими стикається цей сектор. Загалом, використання ІТ-рішень є важливим елементом успішної адаптації українських видавництв до сучасних викликів та забезпечення їхньої конкурентоспроможності.

Ключові слова: видавнича галузь, ІТ-інновації, цифрова трансформація, сучасні технології, qr-коди, VR, електронні книги, аудіо книги.

Formulation of the problem

The lack of significant financial resources in publishing houses becomes an obstacle to investment in the latest technologies and digital innovations. Increased competition from electronic and foreign publishers drives the need to develop effective strategies to retain and expand the audience. Changing reading habits and demand for digital content presents the challenge for publishers to adapt to the new realities of the reader market. Most publishing houses in Ukraine face the challenge of moving to digital formats, as many of them remain faithful to traditional print content. The lack of unified standards and infrastructure for sharing digital content leads to duplication of effort and insufficiently optimized processes in the industry. Large-scale trends in the information society, which are rapidly changing, determine the relevance of the use of IT solutions in the publishing industry of Ukraine. Activities for the creation, editing, printing and distribution of books are rapidly moving into the digital sphere, which raises the question of how to effectively use IT solutions to optimize processes in the Ukrainian publishing house. The application of IT technologies allows publishers to produce and distribute electronic and audio-books, as well as optimize production processes [5]. IT systems enable publishers to analyse reader preferences, collect sales data, and engage with audiences, helping to personalize offerings and respond effectively to changes in market conditions [15]. The implementation of IT solutions can foster innovation in the creation and presentation of additional content, such as the use of virtual reality, interactive elements and other technologies, providing publishers with the ability to engage with readers through social networks and online platforms, making this process more efficient and personalized.

Analysis of recent research and publications

Many Ukrainian scientists have focused their research on addressing various issues in the field of publishing and printing activities. Researchers exploring the development trends of the publishing market in Ukraine and whose scientific works are dedicated to solving problems in the publishing industry include O. Afonin [1], M. Zhenchenko, K. Indutna, O. Osadcha, N. Petrova, M. Senchenko, O. Sukhorukov. The analysis of indicators in the publishing sector has been conducted by scholars S. Buryak, N. Muzichenko [2], H. Gret, and A. Murakhovsky.

Such researchers as Harman M., Jegede O. explore current technologies in publishing, especially in Digital Media and Ebooks [7, 9]. New technologies in digital publishing are explored in such works as [3; 4]. Many scientists and creative teams consider the features of Technology-based self-publishing platforms [13]. Research by Macquarie University's Faculty of Business and Economics examines how new digital technologies are affecting author-publisher relationships, based on a survey of 1,000 Australian authors [8].

Formulation of the purpose of research

The purpose of the research is to study and analyze the impact of IT innovations on the transformation of the publishing industry of Ukraine with a focus on the use of modern technologies and the determination of development prospects. The study is aimed at analyzing and determining the role of IT innovations as a key factor in the formation and transformation of the publishing industry of Ukraine, in particular, the assessment of their impact on production and editorial processes, the development of digital technologies and interaction with the audience. The task of the work is also the formulation of recommendations for publishers that will contribute to effective adaptation to modern challenges and increase the competitiveness of the publishing industry in the conditions of a rapidly changing information environment.

Presentation of the main research material

One of the approaches to the implementation of IT technologies is the use of interactive elements in printed or electronic publications, which has significant potential and relevance. Let's look at specific examples of the implementation of interactive elements in print or electronic publications. Adding QR codes to printed books or magazines that open related materials when readers scan the codes with a smartphone allows readers to instantly access additional content such as videos, audio, websites, rich materials, or other interaction elements. QR codes can be used to provide links to more detailed

information, such as author biographies, video interviews or research sources, and other materials. Publishers can use QR codes to provide additional information about themselves, provide contact details, or offer collaboration opportunities. QR code scanning speed in Europe and the US has doubled in the last 3 years. Africa and the Middle East are also rapidly adopting the use of QR codes, increasing their use by 60% annually [14]. The structure of QR codes can vary depending on the application and the information that needs to be included. Some QR codes may have different colors and visual elements to enhance the design, but it is important to consider that this can affect readability and functionality. Taking these elements into account, the structure of the QR code allows you to efficiently encode and transmit information, which makes their use convenient and versatile in various applications.

The use of QR codes can make reading more interactive and interesting, allowing readers to delve deeper into the content and improving the reading experience. To describe some QR codes, the term “secret QR code” is acceptable, which is not defined by a specific standard, but is used for QR codes that are intended for special calls, creative decisions or effective experiments. They are created to implement concepts that are based on the idea of secrecy or causing intrigue. This may include additional, intriguing, or exclusive content that may be unexpected to the reader, such as launching interactive elements or solving puzzles. The addition of QR codes stimulates interaction with technology, which is usually attractive to young people or those who value innovation. Readers can use QR codes to quickly navigate to specific chapters, additional resources, or order products that are related to the book.

Publishers can use QR codes to advertise their other publications, events, promotions or offers. It can work as an effective marketing tool. QR codes allow you to track how often they are scanned and receive analytics on the performance of additional content or advertising campaigns. In general, adding QR codes to printed books or magazines expands the possibilities of interaction and provides additional ways for readers and publishers to get information.

Using interactive elements to expand images in book editions allows you to create more dynamic editions that go beyond the traditional constraints of printed pages. Readers can click on the image to see details or study specific items that interest them. This is especially useful for illustrations or paintings where a more detailed sweep is possible. Expanded images may contain animations or be associated with other images or content. Clicking on certain items can cause images to change or reveal additional layers of information. Images can be associated with audio or video fragments. For example, a reader can click on special places in an image to hear a corresponding audio commentary or view a short video. The use of 3D technologies allows you to create images that can be rotated or changed perspective to better view objects or scenes.

Images can have interactive captions or descriptions that appear when you hover or when you click the mouse. Interactive elements in images can provide links to additional materials, such as information about authors or resources for further research.

Adding animations and videos makes the content more attractive and expressive. Animations and videos allow authors and publishers to express stories and concepts emotionally. This can be especially useful for children's books, educational materials, and fiction. Animations and videos help in conveying complex ideas or processes, making the assimilation of information more efficient and easy for readers. Being able to interact with animations or videos, such as stopping, rewinding, or selecting specific elements, allows readers more control over their reading experience. Images may include interactive tasks or exercises that encourage readers to interact and develop their knowledge through visual content.

Using video allows you to create virtual tours that help readers delve into the imagery or surroundings of the story. For example, electronic publications about art can include links to virtual tours to the museum, where readers can virtually view paintings and learn about their history and authors. In historical publications, you can include links to virtual tours of historical places, events or monuments. Readers can explore the era, unfold the event map, and join the story. In this way, they can have a deeper understanding of places, events or concepts thanks to virtual tours and interactive maps.

Animations can help convey the dynamism of events or changes in time. They can also create a sense of context and place. Videos and animations can be combined with other media elements, such as images, audio, or interactive elements, to create a multimedia experience.

Some e-books can use virtual reality (VR) technology to create interactive reader research in the form of games or virtual walks. Virtual reality can immerse the reader in the story, creating the illusion of presence in important scenes. The reader can interact with the objects or lenses of the virtual world, influencing the course of the story. VR can convey emotions through visual and sound effects, increasing emotional engagement. For example, educational or scientific publications may include educational simulations to improve understanding of complex topics. Books for children can contain interactive illustrations where children can interact with characters or objects using VR. The use of virtual reality in book publishing opens up a wide scope for creativity and innovation, allowing for more immersive and immersive reading experiences. The global augmented and virtual reality market is forecast to grow to \$162.71 billion by 2025, and the average annual growth rate will be 46% [10]. In e-books, you can allow readers to leave feedback and comments right on the pages, creating a community of readers. The use of interactive elements adds new capabilities to the publishing process, providing more ways for readers to interact with content and enjoy reading more. Modern technologies in the field of publishing and technical editing can greatly facilitate the workflow and improve the quality of products. Here are some technologies that are now actively used in these industries. Ukrainian and world publishing houses use a variety

of spelling and grammar checking systems to ensure high quality of texts in publications. Popular systems include, for example, LanguageTool, which is an open grammar checker that supports many languages, including Ukrainian. One of the most popular online grammar and style checking systems is Grammarly. It is used as a plugin for various text editors and web environments and allows you to detect and correct various types of errors, ensuring a higher quality of text. Also popular is the ProWritingAid platform, which provides a wide set of tools for checking grammar, style, word usage and sentence construction. Named systems help to automatically detect and correct errors in the text, improving the quality of speech. Ukrainian publishers can use a combination of these systems and other language tools to guarantee a high standard of texts in their publications.

The use of specific revision control systems to track document changes and collaborate on editorials may vary across publishers depending on project specifics, volume of work, number of contributors to development, and other factors. However, many technology-oriented companies and publishers in the world use popular version control systems such as Git [6] and collaborative and development management platforms such as GitHub, GitLab [6], or Bitbucket. These tools allow teams to work together efficiently, track changes, and manage versions of code and other materials.

Artificial intelligence (AI) opens up many possibilities for automating and improving processes in publishing and technical editing. Let's break down some examples of how AI can be used in these industries.

The use of machine learning algorithms to automatically generate a text summary can be applied to annotating publications, bibliographic descriptions, and abstracts. Artificial intelligence can be effectively used to automatically classify content in publishing houses, which simplifies and speeds up the processes of editing, organizing and distributing materials. AI can automatically identify the topic of articles or materials and distribute them to the appropriate categories. For example, a news site can use AI to distribute news by topics: politics, economics, culture, etc.

Identifying the emotional tone of a text with AI allows publishers to analyze how readers react to articles, reviews, or news, which can be useful for gauging popularity and determining how content affects audiences. Automatic analysis of emotional tone allows publishers to detect negative or offensive content and assist editors in correcting or highlighting important aspects of materials, which can also be useful for filtering unwanted or objectionable content such as spam, offensive material or false information. Understanding the emotional tone of a text can help in recommending personalized content for readers, taking into account their emotional preferences and moods. AI can be used to analyze social networks and determine the emotional attitude of the audience towards specific publications or topics. Understanding how readers respond to content can help in developing emotional marketing strategies and creating campaigns that are more connected to your audience. Determining the emotional tone of a text can serve as an indicator of general trends and moods among readers, to analyze popularity, which helps publishers adapt to the demand for specific content and can be useful for forecasting and determining content development strategies. Automated image processing allows the use of machine vision algorithms to automatically analyze and process graphic content, which includes object recognition, placement, analysis of colors, textures, and other characteristics of images. For example, IT can automatically determine the placement and size of images in text, without human intervention, saving time and effort that would normally be required for manual processing, and could have practical applications in publishing where a lot of text is accompanied by graphic content. This process will increase the efficiency of publishing production, reducing the risk of errors in the placement and processing of graphic elements in the text. Automated image processing using machine vision algorithms allows you to optimize and improve work with graphic content, which is important in modern publishing.

Audio and electronic publications are a promising alternative to traditional paper formats, marked by growing popularity and the introduction of innovations in the modern publishing environment. Ukrainian book publishers have recognized the advantages of electronic publications, but at the same time they have shown themselves to be less interested in the development of audio books, underestimating their potential and popularity among readers. With the emergence of new and improved platforms for audio books, Ukrainian readers have access to a wide selection of works by both domestic and international authors. Audio books can be used to promote Ukrainian literature at the international level and promote the study of the Ukrainian language through its acoustic perception.

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In global markets, analysts predict an increase in sales of audio books by almost 25% every year. For example, according to the Audio Publishers Association of America, more than 71,000 audiobooks were published in the US in 2020, which is 39% more than the year before. The prospects for the development of audio books in Ukraine look quite attractive, because this format finds its place in modern reading and meets the everyday and cultural preferences of readers. For 2020–2021 the

Table 1

Analysis of formats: print editions, e-books and audio books

Characteristics	Printed books	Electronic books	Audio books
Portability and convenience	physical volume makes it difficult to store and move	conveniently a large number of books in one device	easy listening anywhere, convenient storage of a large number of books in one device
Reading conditions	need a light source to read	the ability to use the backlight of the screen, the device must be charged	listening in any conditions, the device must be charged
Interactivity and multimedia	limited interactive capabilities	wide range of options	no
Sensory sensations	smell and tactile sensations	no	no
Interacting with text	reading text without the ability to choose font or size	ability to customize fonts and sizes no	no
Ability to underline and take notes	easy to take notes and underline	ability to take electronic notes	usually no

Ukrainian audiobook market grew 10 times [11]. The growing popularity of audiobooks creates opportunities for local publishers and artists. The development of the domestic market leads to the creation of Ukrainian-language audio content. The use of speech recognition technologies and other innovations allows to improve the quality of audio content and makes it more accessible to a wide range of readers. Audiobooks can be used for educational purposes, in particular to facilitate the study of foreign languages, to develop auditory perception and to facilitate educational projects.

In general, the audiobook market in Ukraine has prospects for growth, especially if technological development and content expansion continue, as well as taking into account the linguistic and cultural characteristics of the audience.

Conclusions

The study of the impact of IT innovations on the transformation of the publishing industry in Ukraine provides strong conclusions on the development prospects of this sector. It is noted that the introduction of modern technologies indicates the need to adapt Ukrainian publishers to the challenges of the digital era. First, the application of e-books and virtual reality can open up new opportunities to engage readers and expand audiences. The use of QR codes in books allows readers instant access to additional content, expanding their reading experience and providing the ability to interact with a variety of multimedia and interactive elements. Second, interactive content and artificial intelligence can help improve the quality of the publishing product by providing a higher level of engagement and engagement with readers, particularly the use of data analytics to understand reader needs and provide personalized suggestions. This opens up new horizons for creativity and innovation in the field of content. Thirdly, the analysis of the experience of other countries indicates the prospects of audiobooks. It is important to consider that audiobooks can effectively contribute to the dissemination of knowledge of the Ukrainian language and to take into account the cultural characteristics of the audience. The development and implementation of interactive and attractive electronic platforms for easy access to the content of audiobooks is relevant. Fourth, the use of intelligent systems to automate editorial and production processes will help reduce the number of routine tasks in the publishing house, which will increase the efficiency, speed and accuracy of production processes, as well as open opportunities for creative growth and qualitative improvement of the level of editorial work. Ukrainian publishers can take these aspects into account and adapt them to the local context.

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