A Brief Discussion on the Application and Development of Big Data in Photography: Postprint

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Abstract

With the rapid development of societal science and technology and the continuous improvement of residents' living standards, people have imposed new requirements and elevated standards for photographic technology. Accordingly, this paper will elucidate the connotation of photography big data, analyze the applications of big data in photography, and elaborate on the development of big data in photography, aiming to facilitate the co-development of big data and the photography industry and propel the flourishing development of the photography business.

Full Text

Media Industry Practices · Media Business Formats: A Brief Discussion on the Application and Development of Big Data in Photography

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Abstract: With the rapid development of social technology and the continuous improvement of people' s living standards, new demands and higher standards have been placed on photographic technology. This paper elucidates the connotation of photography big data, analyzes its application in photography, and expounds on its development, aiming to promote the mutual growth of big data and the photography industry and propel the vigorous development of the photography business.

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As the pace of technological development continues to accelerate, traditional creative concepts in the photography industry can no longer meet contemporary audience needs. In the era of big data, new media has not only influenced the cultural essence of imagery but also challenged traditional photographic concepts, thereby enabling audiences to achieve a deeper understanding of modern civilization. Against this background, this paper provides a brief analysis of the application and development of big data in photography, aiming to promote the coordinated development of big data and the photography industry.

Currently, the scope of photography big data in China mainly includes: (1) photography enterprises and works, encompassing data on photography companies, photographers, equipment and products, and photographic works; (2) photographic image data, referring to information related to transactions between photography products and consumers, including economic transaction records; (3) image information and creative data, which constitutes the information needed before shooting works; and (4) internet usage data, referring to transaction or information data generated by users through social media platforms. From the above, it is evident that the mobile internet era has given further impetus to the development of photography big data.

1.1 The Connotation of Photography Big Data

Big data can be divided into cultural and industrial categories. From a cultural perspective, photography culture big data refers to content big data. The renowned American photographer Rick Smolan collaborated with nearly a hundred photographers from different countries using a big data photography approach to complete *A Day in the Life*, which was well-received by photography enthusiasts. Subsequently, he continued using this approach to create *The Human Face of Big Data*. In Smolan' s view, "cloud computing" is like a chef' s cooking tools, while "big data"is the master chef who understands customer preferences and possesses extensive experience. Cloud computing and big data work together to efficiently serve massive numbers of customers, providing them with excellent sensory experiences. By the same token, photography big data operates similarly. Its primary function lies in collecting, analyzing, and processing data resources and incorporating them into databases for future reuse. Generally, cultural data refers to photographic image information resources, with greater emphasis placed on photographic works themselves. Photographic works convey ideas and intentions to audiences through direct visual impact. From cultural and technical perspectives, photographic works are influenced not only by regional, visual, and spatial factors but also by socio-economic, historical, and humanistic elements. From these aspects, it is not difficult to see that photographers are often limited to perceptual levels and practical experience, making it difficult to express the cultural significance of their works. Although the internet has elevated photography big data to a higher level, many photog-

raphers argue that, from a rational cognitive perspective, internet technology has not truly understood the meaning of photography. In the early history of photography, individual photographers began exploring the transition from perceptual to rational approaches, selectively documenting local customs and practices in different regions—an approach that essentially embodies the principle of big data, though people at the time were not aware of the concept.

[Figure 1: see original paper] *My Bride and I*, photographed by Qiu Zhen

1.2 The Mobile Internet Era' s Role in Photography Big Data

With the rapid development of "Internet Plus," cloud computing and big data have been widely applied across various industries. Big data is divided into three types: structured, semi-structured, and unstructured data, characterized by four major features: large volume, high efficiency, high value, and rich variety. It also possesses transformative properties, including the transition of data types from structured to semi-structured and unstructured forms, the adoption of real-time streaming data processing methods, and the scaling of data volume from terabytes (TB) to petabytes (PB), exabytes (EB), and zettabytes (ZB). With the continuous acceleration of technological development, the photography industry has constantly faced challenges posed by emerging technologies such as 3D photography, computational photography, and beauty element photography since their inception. It is evident that big data holds profound significance for the development of the photography industry, as it enables efficient utilization of photographic data and injects new vitality into the development of photography big data.

2.1 Building Photography Big Data Based on Image Libraries

To promote the further development of photography big data in the internet era, the primary task is to construct photography big data by incorporating massive amounts of photographic data into databases to facilitate search and use, thereby improving work efficiency. With the rapid development of social technology and the continuous improvement of living standards, people have placed new demands and higher standards on photographic technology in the new era. Currently, photography big data built on the foundation of image libraries [Figure 2: see original paper] (screenshot from a photography image library) is gradually becoming widespread, and the "Internet Plus Photography" model is developing steadily. The operational models, concepts, and systems of traditional photography industries are continuously being revolutionized, fully implementing the development philosophy of "boosting industry through data."Against this background, professionals working with photography big data should possess rich professional knowledge, accurately analyze photographic data, and continuously intensify data mining efforts to improve work efficiency and maximize the utilization of photography big data. Additionally, they should comprehensively optimize the management of photographic data, systematically maintain and update relevant photographic information, provide

raw materials for advancing the photography industry toward the big data track, and transform scattered data information into digital information resources to enhance the orderliness of the photography industry.

From the perspective of cloud computing and big data, achieving rapid data search and classification requires a foundation built on image libraries, followed by intelligent analysis and data computation from massive databases. Naturally, this series of operations relies on corresponding foundational platforms to provide support for the design and construction of photography big data. In practical implementation, when constructing foundational photography big data, image library data must be used as preliminary information, which is then processed and classified, starting from "small data" and eventually developing into massive big data. In other words, when practically applying photography big data related to image libraries, industries related to photography work will inevitably be involved. Moreover, image libraries are not static; they continuously evolve with industry development and consumer needs, transforming from "small data" into massive big data and even consolidating scattered data into systematic storage for reuse. In summary, constructing photography big data must be based on image libraries, developing from "small data" to big data. Simultaneously, image libraries possess certain variability, changing according to external needs, and data processing methods are also continuously evolving. Therefore, photography big data built on the foundation of image libraries exhibits certain variability and uncertainty.

2.2 Establishing Photography Industry Cloud and Big Data Platforms

At present, the photography industry exhibits a relatively high degree of informatization with increasingly widespread application, coupled with the continuous popularization of the internet, making the establishment of photography industry cloud and big data platforms a reality. With the construction of photography website clusters and national photography museums, the informatization level of the photography industry continues to deepen. However, this current state still cannot satisfy the development needs of the photography industry. Therefore, during the process of deepening informatization, the photography industry must break free from the constraints of traditional public clouds, minimize dependence on public clouds as much as possible, and enable photography industry clouds and big data platforms to become relatively independent entities with their own distinctive characteristics as "industry clouds and big data." Additionally, the current construction of big data industry clouds remains in its initial stages, with information construction work yet to find breakthrough points. Construction efforts are limited to dispersing image libraries, establishing big data tracking platforms, displaying photographic works, and expanding application development channels.

[Figure 2: see original paper] Screenshot from *Ice Age*, a 3D animated film by 20th Century Fox

Within big data platforms, corresponding photographic works, photography markets, equipment, and related data materials should be organically integrated to maximize big data utilization. Secondly, in comprehensive data platforms, data from the photography industry, education sector, and management work must be consolidated, using public cloud commercial tool software to conduct targeted processing and analysis of these dispersed data. During this process, the industry should capture data resources from the internet and incorporate massive amounts of data information into a designated "container" to achieve resource sharing between photography industry clouds and big data platforms. Currently, photography website clusters in national photography associations and national photography museums have begun establishing photography industry cloud and big data platforms, attempting to apply their advantages to practical work. However, due to certain limitations, the development direction of photography big data has not been clearly defined, resulting in certain defects in the construction of big data platforms. In summary, at this stage, the construction of photography industry cloud and big data platforms still faces some issues that require appropriate adjustments during future applications to successfully build these platforms as soon as possible.

[Figure 3: see original paper] 3D photo of Yuanmingyuan from the documentary *Yuanmingyuan*

2.3 Emphasizing Big Data Applications

Currently, copyright issues have attracted significant attention in the photography industry. Photography associations have already analyzed and researched copyright issues regarding work display, member management, and product sales. Relevant scholars suggest that using big data technology to protect copyright yields good results, while various picture agencies and image libraries can achieve resource sharing and network marketing. With the continuous improvement of network coverage and the deepening of photography informatization, big data technology is bound to break through in fields such as digital production, work transactions, and digital display. Moreover, big data applications should still focus on data development, utilization, analysis, and consumption. In practical operations, the industry should draw on relevant successful internet experiences to promote the deep integration of cloud computing and "Internet Plus," maximizing the overall level of the photography industry.

3.1 Constructing a Photography Big Data Ecosystem

At present, the photography big data ecosystem is developing rapidly with extensive coverage, including photography development, innovation, and upgrading. These projects are heavy tasks involving large data volumes, presenting certain difficulties in practical implementation. Therefore, in future photography big data development, the integration between big data technology and various media should be deepened, and photography big data should be timely updated and improved to foster the emergence of new business formats. In summary,

big data technology holds profound significance for the photography industry and plays a crucial role in advancing the photography industry chain.

In the actual process of constructing big data systems, the industry needs to emphasize talent cultivation and encourage innovative development to inject continuous new vitality into the construction and development of big data ecosystems. However, due to deficiencies in China' s photography education system and imperfect institutions, industry competitiveness cannot be improved in a short period, making it difficult to fully leverage the role of big data technology. Therefore, the photography industry should emphasize the cultivation of photography talent and actively encourage them to join the team building big data ecosystems, providing a foundation for the mutual growth of big data and the photography industry. Additionally, relevant personnel need to be guided by the deep integration of economy and photography to form a favorable new economic normal. Although copyright issues must be emphasized during big data application, data sharing and openness cannot be neglected. Under the influence of cloud computing and the "Internet Plus Photography" model, the photography industry needs to coordinate and manage data processing, deeply 挖掘 data value, and pave the way for industry upgrading and transformation.

3.2 Accelerating Media Convergence

From the perspective of big data development in the photography industry, photography big data needs to strengthen integration with other media to achieve high-level sharing of data resources and improve utilization rates. At the current stage, "Internet Plus" is developing well in the photography industry. However, during this process, the photography industry must remain vigilant, flexibly adjust its development approach, implement work practically, adopt new methods, continuously open up new business formats, actively integrate cross-industry resources, resolve issues such as system silos and industry barriers, and form new thinking and models for industry development. In summary, in future photography big data development, media convergence must be accelerated to achieve data sharing, continuously improve data utilization rates, and take the new internet mindset as the core of development, thereby forming a well-developing big data ecosystem. Moreover, as big data platforms become increasingly user-oriented, platform-based, and open, social resources will be reorganized and transformed, and photography big data will develop toward sharing. In conclusion, big data development cannot be separated from high-level media convergence.

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Note: Figure translations are in progress. See original paper for figures.