

Journal of Electronic Research and Application

Editor-in-Chief

Manivel K.

Mahendra Engineering College, India

BIO-BYWORD SCIENTIFIC PUBLISHING PTY LTD

(619 649 400)

Level 10

50 Clarence Street

SYDNEY NSW 2000

Copyright © 2021. Bio-Byword Scientific Publishing Pty Ltd.

Complimentary Copy



ISSN (ONLINE): 2208-3510
ISSN (PRINT): 2208-3502

Journal of Electronic Research and Application

Focus and Scope

Journal of Electronic Research and Application is an international, peer-reviewed and open access journal which publishes original articles, reviews, short communications, case studies and letters in the field of electronic research and application.

Topics covered but not limited to:

- Automation
- Circuit Analysis and Application
- Electric and Electronic Measurement Systems
- Electrical Engineering
- Electronic Materials
- Electronics and Communications Engineering
- Power Systems and Power Electronics
- Signal Processing
- Telecommunications Engineering
- Wireless and Mobile Communication

About Publisher

Bio-Byword Scientific Publishing is a fast-growing, peer-reviewed and open access journal publisher, which is located in Sydney, Australia. As a dependable and credible corporation, it promotes and serves a broad range of subject areas for the benefit of humanity. By informing and educating a global community of scholars, practitioners, researchers and students, it endeavors to be the world's leading independent academic and professional publisher. To realize it, it keeps creative and innovative to meet the range of the authors' needs and publish the best of their work.

By cooperating with University of Sydney, University of New South Wales and other world-famous universities, Bio-Byword Scientific Publishing has established a huge publishing system based on hundreds of academic programs, and with a variety of journals in the subjects of medicine, construction, education and electronics.

Publisher Headquarter

BIO-BYWORD SCIENTIFIC PUBLISHING PTY LTD

Level 10

50 Clarence Street

Sydney NSW 2000

Website: www.bbwpublisher.com

Email: info@bbwpublisher.com

Table of Contents

1	Application of Big Data Analysis Technology in Cross-Border E-Commerce <i>Yanan Song</i>
4	Discussion on E-books and Library Borrowing Service <i>Weiguo Xie</i>
8	Summary of the Performance of V2O5 Materials as Lithium Battery Cathode <i>Weihaio Wang</i>
18	Comparison of the Development of TikTok and Bilibili <i>Yiting Sun</i>
23	Discussion on the Application of Enterprise Business Intelligence Data Analysis System <i>Ning Yang</i>

Call for papers–Journal of Electronic Research and Application

ISSN (ONLINE): 2208-3510

ISSN (PRINT): 2208-3502

Submission open for September - 2021

Dear Researchers,

Dear Researchers,

Journal of Electronic Research and Application is an international, peer-reviewed and high quality open access journal which publishes original articles, reviews, short communications, case studies and letters in the field of electronic research and application.

The Journal Publishes in both online and print version. Journal of Electronic Research and Application publishes research and review paper in the field of:

- Automation
- Circuit Analysis and Application
- Electric and Electronic Measurement Systems
- Electrical Engineering
- Electronic Materials
- Electronics and Communications Engineering
- Power Systems and Power Electronics
- Signal Processing
- Telecommunications Engineering
- Wireless and Mobile Communication

The Journal of Electronic Research and Application is published by Bio-Byword Scientific Publishing Company, it is a fast growing peer-reviewed and open access journal publisher, which is located in Sydney, Australia. As a dependable and credible corporation, it promotes and serves a broad range of subject areas such as medicine, construction, education and electronics for the benefit of humanity. By informing and educating a global community of scholars, practitioners, researchers and students, it endeavours to be the world's leading independent academic and professional publisher.

All Bio-Byword journals are free from all access barriers, allowing for the widest possible global dissemination of their manuscripts and highest possible citations. Bio-Byword publisher online submission will go through a rapid peer review and production, making the process of publishing simpler and more efficient, which benefit from its user friendly online submission system that reduces the overall time from submission to publication.

Acceptance Notification: Within 21 days from the date of manuscript submission

Send your manuscript to the editor at: info@bbwpublisher.com

With Warm Regards,

Editor-in-Chief

Dr. Manivel K.

Journal of Electronic Research and Application

Application of Big Data Analysis Technology in Cross-Border E-Commerce

Yanan Song*

University of California, Irvine, The United States of America

*Corresponding author: Yanan Song, 6651118@163.com

Abstract: Under the background of national development strategy in the new era, cross-border e-commerce with the help of Internet platform can realize the interconnection between producers and consumers, and gradually expand the influence of international trade. Based on big data technology, this paper builds an industry chain with cross-border e-commerce members' participation, and analyzes the specific application of big data in the product support, internal operation, external marketing, logistics service and service evaluation of cross-border e-commerce industry chain. The purpose is to effectively promote the healthy development of cross-border e-commerce and improve China's trade and economic level.

Keywords: Big data; Cross-border e-commerce; E-commerce

Publication date: July 2021; **Online publication:** July 31, 2021

1. Introduction

Based on the perspective of the industry chain, using big data to study cross-border e-commerce and discover new economic growth points has become a new value demand for cross-border e-commerce development in the era of big data. The drive of big data technology plays an important role in cross-border e-commerce transactions. Its application value and ideas are mainly reflected in the five major links of the cross-border e-commerce industry chain: product support, internal operations, external marketing, cross-border logistics and service evaluation (Figure 1.).

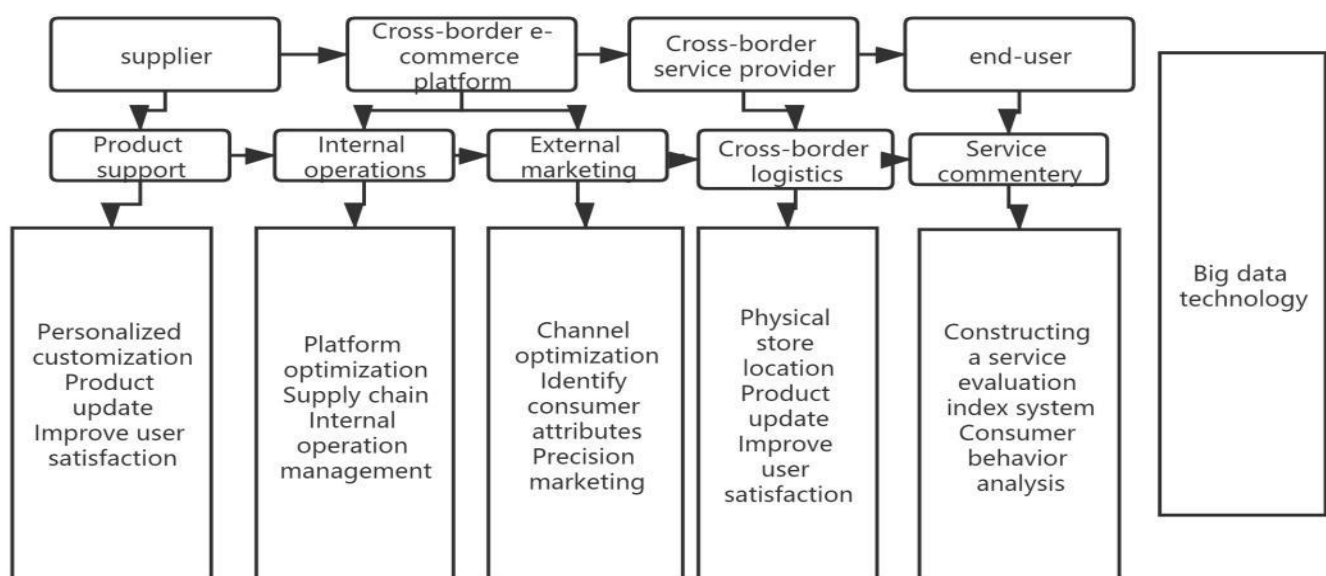


Figure 1. Application framework model of cross-border e-commerce industry chain based on big data technology

2. Product Support

The effective combination of big data and product support has become a key means for suppliers to enhance product competitiveness. As the core support of products, the function embodied by big data is to be able to analyze customer's personalized demand information for products, carry out personalized design of products, meet the personalized needs of users, provide differentiated services, and expand differentiated markets. In addition to the economic activities of the enterprise, another very important application path is to improve and optimize the product itself through the unified needs and suggestions of customers for the product, so that the update of the product highly meets the needs of customers, thereby improving cross-border electricity ^[1]. The satisfaction rate of core users of commercial products improves the economic benefits of cross-border e-commerce companies.

3. Internal Operations

Cross border e-commerce is the product of the combination of foreign trade and information technology, and its development is inseparable from the construction of internal support conditions. At the internal operation level, the information service function design of cross-border e-commerce platform tends to be convenient and diversified driven by big data technology. From the perspective of cross-border e-commerce platform optimization, cross-border e-commerce enterprises can make full use of big data to optimize their own websites, adjust the information function of cross-border e-commerce platform, ensure that the content of the web page is more detailed and substantial, enrich consumers' perception of products when purchasing, and avoid the limitations of the original traditional manual data processing, such as lag, low efficiency and distortion ^[2]. From the perspective of supply chain management efficiency, based on big data technology, the sources of enterprise source information tend to be diversified. Cross border e-commerce enterprises need to rely on big data technology to determine the key factors of supply chain efficiency, and make reasonable design and arrangement according to the key factors, so as to improve the operation efficiency of cross-border e-commerce enterprises' supply chain as far as possible.

4. External marketing

In the external marketing link, cross-border e-commerce companies can identify user attributes based on big data technology and formulate reasonable and targeted marketing strategies. Cross-border e-commerce companies can distinguish whether users are long-term customers or potential customers based on the relevant big data of users on the cross-border e-commerce platform, and then develop marketing strategies that meet their characteristics for different users based on user attributes, and establish a good relationship with users. The cooperative and interactive relationship achieves a win-win situation for both parties in the transaction (**Figure 2.**).

5. Cross-border logistics

With the advent of the "big data" era and the continuous development of cross-border e-commerce, the combination of big data technology and cross-border logistics has also become an inevitable trend of development. Using big data analysis technology to reasonably select physical store locations, establish a data analysis management system based on logistics data, and select the most suitable delivery method according to the time and address of the user's receipt of goods to provide customers with high-quality logistics services. In addition, in response to the information feedback from the big data of cross-border e-commerce logistics, cross-border e-commerce companies can adjust the number and location of commodity storage, increase the storage of popular commodities in hot-selling regions, and reduce the storage of unsalable commodities in unpopular regions.

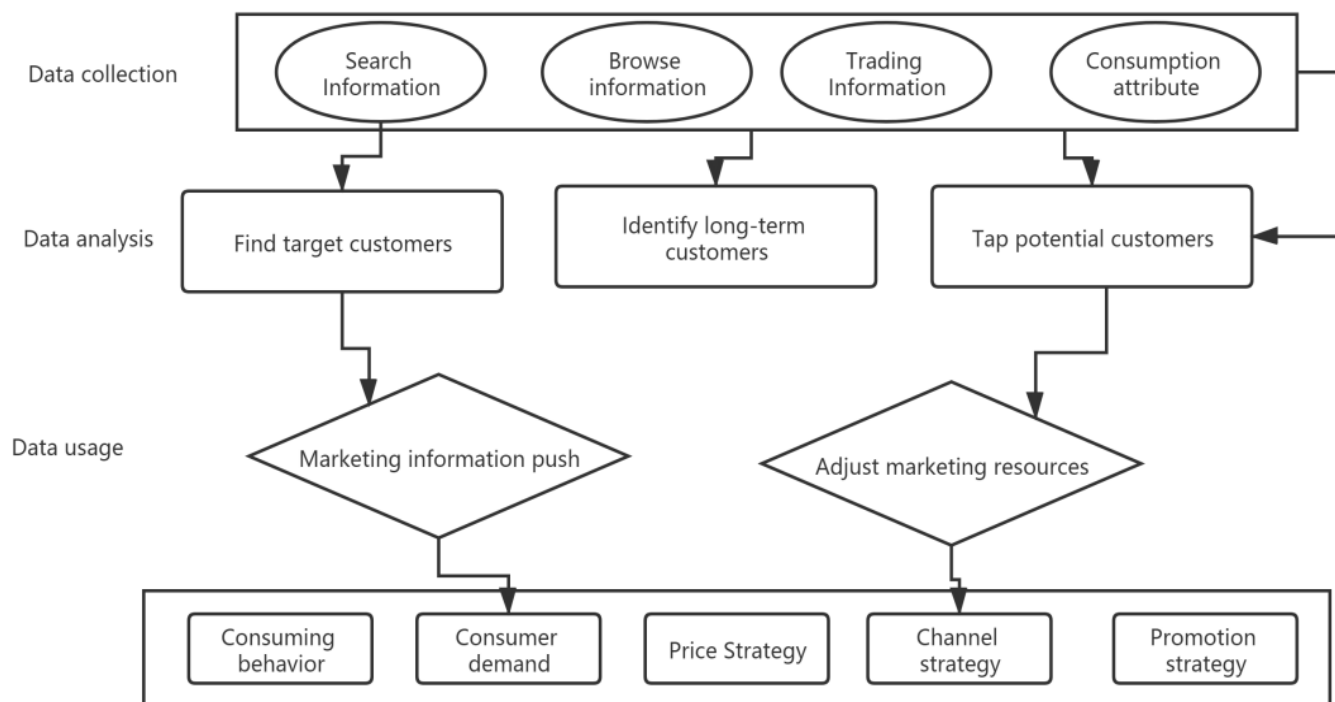


Figure 2. Application of Big Data Technology in External Marketing

6. Service commentary

Combined with the actual situation of cross-border e-commerce in China, from the perspective of service process of cross-border e-commerce, we make full use of the Internet and big data to design, build the cross-border e-commerce service evaluation index system, and further improve the cross-border e-commerce service management mechanism and government supervision ^[3]. Based on the perspective of consumers, the big data technology is used to analyze the service experience and evaluation of consumers on cross-border e-commerce, so as to analyze the behavior of customers in cross-border e-commerce platform and study the consumer psychology of cross-border e-commerce users, so as to make it easier to lock in potential customers and provide personalized services

Disclosure statement

The author declares no conflict of interest.

References

- [1] Ma G, n.d., Research and Application of Operational Model in Cross-border E-commerce Based on Big Data Technology, Institute of Management Science and Industrial.
- [2] Engineering, 2019, Proceedings of 2019 7th International Conference on Machinery, Materials and Computing Technology (ICMMCT 2019). Institute of Management Science and Industrial.
- [3] Engineering, 2019, Computer Science and Electronic Technology International Society, 4.

Discussion on E-books and Library Borrowing Service

Weiguo Xie*

Library of Zhongyuan Institute of Technology, China

*Corresponding author: Weiguo Xie, 2496828821@qq.com

Abstract: With the vigorous development of network information technology, e-book borrowing service came into being and showed a vigorous development trend. Therefore, in order to strengthen the service function, the library needs to gradually improve the e-book borrowing service, so as to provide readers with high-quality service content, so that the library can give full play to its function of disseminating scientific and cultural knowledge. Therefore, in this article research, we first discuss the main reading methods of e-books, then investigate the current reading situation of e-books and traditional paper books in the library, and then put forward corresponding development strategies to effectively promote the rapid development of the library and strengthen the level of e-book borrowing service.

Keywords: E-books; Library; Borrowing service

Publication date: July 2021; **Online publication:** July 31, 2021

1. Introduction

In the construction and development of our society, network information technology has been widely used and practiced, which has a positive impact on the development and construction of various fields of society. With the continuous development of network information technology, e-books came into being. It can use the Internet as the carrier to spread knowledge, so that readers can read through network channels, which effectively strengthens the convenience of the reading process. At the same time, it is also a more convenient way for readers to obtain books, and give full play to the dissemination function of scientific and cultural knowledge of books. Since the electronic books came into being, the service mode of the library has changed correspondingly. E-book service for the readers has become an important way of service. Therefore, in order to further strengthen the service level of the library, make it better dissemination of scientific and cultural knowledge, it is necessary to strengthen the library borrowing service discussion and research, so as to constantly improve the service mode of the library, so that the library can play a better role in the current network information age.

2. Main reading methods of e-books

With the wide application of Internet technology, e-books have become a new way of reading, and have been favored and recognized by the majority of readers. E-books have good convenience in the reading stage, so they have developed rapidly. In the development, the main reading methods of e-books are divided into the following:

(1) Online reading

Online reading is not only the main form of e-book communication, but also an important way for readers to read e-books. It is mainly that readers search e-books through browsers and then read on the Internet. For example: Readers can log in to the e-book website through computer devices or mobile intelligent

terminals, and then read online for free or paid ^[1]. At present, during the development of e-books, there are relatively few kinds of free e-books that can be provided by various e-book websites. At the same time, the publishing age of various books is relatively long. Paid reading can obtain richer e-book content. Therefore, online paid reading has gradually developed into a mainstream e-book reading method, and has wide recognition in the scope of the public.

(2) Offline download reading

Offline download reading is one of the main reading methods of e-books. It refers to that readers use the corresponding network reading software to download the paid or free books on the website offline, and then generate the file format for readers to read, so that they can read offline on the readers' personal computer or mobile intelligent terminal. At present, the way of offline download reading is also common. Readers can download their favorite e-books through software and use their spare time to read, which has a positive impact on the development of e-books.

(3) Reading on CD

Reading with CD is also an important way of reading e-books. Usually, readers can put the CD into personal computers or other e-reading devices, so that they can read the e-book information in the CD, and then carry out the reading process. In essence, reading through CD is also a way of offline reading. Generally, some e-book supply websites will consider the download rate of e-books, so they will provide readers with paid book CD to enable readers to read offline through CD ^[2]. In addition, some publishing houses in China will also provide electronic CD during the book sale, or issue CD versions of books to help readers improve the convenience of reading.

3. Investigation on the reading status of e-books and traditional paper books in library

In this paper, a random survey was conducted among 100 readers in the form of questionnaire survey to understand the current reading situation of e-books and traditional paper books in the library and readers' preferences for the above two reading methods. The survey results are as follows:

3.1. Comparison of reading convenience survey

The following **Table 1.** shows the survey and statistics on the reading convenience of e-books and paper books. According to the following statistical table, 79 respondents believe that e-books are relatively convenient to read, accounting for 79%. This part of readers believe that e-books are far more convenient than paper books in the reading stage, At the same time, the excellent attributes of e-books are not comparable to those of paper books, such as: Paper books have the function of text retrieval, and can also be consulted in the catalogue, so it is more convenient to find the contents of the whole book. In addition, at the stage of reading e-books, readers can freely use the functions of e-book labels, lines, annotations and highlights. The text in e-books can also be enlarged and reduced with the reader's reading appropriateness, and these advantages are not provided by traditional books. Moreover, e-books have good convenience in the carrying stage. Often, an e-book with about 1 million words occupies only about 10M of storage space, while it exceeds 400g if carrying paper books. Therefore, e-books have stronger convenience than traditional paper books.

Thirteen people think it is convenient to read paper books, accounting for 13%. This part of readers think that although the electronic reading equipment is exquisite and easy to carry, the electronic equipment needs to be turned on or off, and will also be limited by hardware such as power supply. During the reading process, it will be affected by the surrounding light conditions, such as: It's almost impossible to read directly in sunlight. However, if you choose traditional paper books, you can browse books from any angle anytime, anywhere, and will not be limited by the power supply. As for the reading of a book, paper books

are relatively more convenient.

The number of people who hold a neutral attitude towards the two is 8, accounting for 8%. This part of readers believe that traditional paper books and e-reading have their own advantages, so they will choose e-reading or paper reading according to their own preferences and specific reading environment.

Table 1. Survey and statistics of reading convenience of e-books and paper books

	E-book is convenient	Paper book is convenient	Each has its own advantages
Number of people	79 people	13 people	8 people
Proportion	79%	13%	8%

3.2. Comparison of reading comfort survey

Table 2. below is a statistical table for the reading comfort of electronic books and paper books. It surveys 100 readers on the reading comfort of electronic books and paper books respectively and makes statistical table 2 below. Among them, 75 people thought that e-reading was more comfortable, accounting for 75%. This part of readers thought that the reading method of e-books had good convenience. At the same time, e-books only need to move a finger to complete the page turning process during reading, while traditional paper books need to turn the pages manually one by one. At the same time, small and exquisite handheld electronic devices are more comfortable in the reading stage, so the comfort of choosing e-reading mode is obviously better than traditional paper books.

The number of people who think that the reading method of paper books is more comfortable is 34, accounting for 34%. This part of readers think that there are great differences between paper book reading and e-book reading. It needs to be applied to e-reading equipment and related reading software, and the essence of this reading method is to see the content display on the screen, which belongs to a kind of “screen reading,” In the reading stage, the screen will reflect, flicker and shake, causing discomfort to people’s eyes. If reading for a long time, it is prone to visual fatigue, while the selection of traditional paper books will not produce the above situation. Therefore, it believes that traditional paper books have better comfort. The number of people who think that the reading comfort of e-books is similar to that of paper books is 11, accounting for 11%. This part of readers think that the reading comfort of choosing paper books and e-books is similar. Both of them need readers' attention and eyes to read the contents of books in the reading stage. Reading for a long time will produce problems such as visual fatigue and shoulder and neck pain. Therefore, appropriate activities and relaxation in the reading stage can improve the comfort of the reading stage.

Table 2. Survey and statistics of reading convenient of e-books and paper books

	E-books are comfortable to read	Paper books are comfortable to read	The two are similar
Number of people	55 people	34 people	11 people
Proportion	55%	34%	11%

4. Library e-book borrowing service strategy

4.1. Changing the concept of book service

In the daily operation and development of the library, book service is an important content. Whether to provide readers with high-quality book service also determines the readers’ reading experience and satisfaction. Therefore, in order to effectively promote the development and innovation of library e-book service, the primary task is to change the book service concept, so as to gradually open up a new service form, so that readers can enjoy high-quality e-book borrowing services in the library ^[3]. First of all, the

library needs to pay attention to innovation, focus on reader oriented, change the service form, make full use of network information technology and various intelligent terminals to provide e-book borrowing services for readers, so that readers can obtain more abundant e-book resources.

4.2. Provide personalized e-book borrowing service

Providing personalized e-book borrowing services for readers is also an important measure to improve readers' satisfaction. At the same time, it is also conducive to the library to give full play to its function of disseminating scientific and cultural knowledge, make the social reading atmosphere stronger, and help strengthen the comprehensive quality of our people ^[4]. For example: The book retrieval function can be set up in the library portal. Readers can carry out book retrieval according to the e-books they need to obtain, improve the convenience for readers to obtain the target books through retrieval, and open some free e-book download services to continuously shorten the distance between the library and readers and enhance the stickiness of readers. In addition, it can also provide customized e-book borrowing services for readers to meet the personalized reading needs of different types of readers, so as to effectively promote the development and innovation of Library e-book borrowing services.

4.3. Improve e-book resources

Improving e-book resources is an important measure. Through this measure, different types of readers can be guaranteed to obtain their favorite e-book resources. Therefore, more energy needs to be invested in this work to strengthen the service function of the library ^[5]. For example: The library can build an e-book resource information database, and then strive to strengthen the integration of various e-book resources, so as to enrich the library's e-book inventory, so that readers can enjoy comprehensive and comprehensive book borrowing services in the library. In this process, the staff of all posts in the library need to strengthen the study of network information technology, understand and study how to correctly carry out e-book borrowing service, so as to effectively improve the service function of the library.

5. Conclusion

To sum up, e-book service plays a vital role in the daily operation and development of public libraries. Whether to provide readers with high-quality e-book borrowing service also determines the operation level of the library. Therefore, it is necessary to scientifically design and plan all links of the work to comprehensively promote the improvement of the e-book borrowing service level of the library.

Disclosure statement

The author declares no conflict of interest.

References

- [1] Liu HZ, 2019, A Study of Electronic Books and Library Borrowing Service. Archives, 009 (009): 42.
- [2] Liu L, Hu XW, Luo YL, 2019, Research on Library E-book Borrowing Policy Based on Stakeholder Needs. Library, 293 (02): 108-115.
- [3] Huang XT, Li YX, Xue WL, 2011, Research on the Application of E-reader in Library Borrowing Services, Library Science Research & Work, 01 (1): 22-22.
- [4] Zheng YY, Yi TS, 2006, Electronic Books and Library Borrowing Service. Journal of Library and Information Sciences in Agriculture, 18 (011): 65-68.
- [5] Xu WH, Chen LS, 2014, Service and Application of Electronic Borrowing System in Library. Lantai world, 32 (No. 454): 119-120.

Summary of the Performance of V_2O_5 Materials as Lithium Battery Cathode

Weihaio Wang*

Room 1303, Building 69, 66 Gulong Road, Shanghai 201102, China

*Corresponding author: Weihaio Wang, isaac_wang2004@126.com

Abstract: Lithium battery has recently gained more and more attention worldwide. It has wide usage that range from toys to electric cars. Choosing a suitable material that best fits the overall performance as electrode for the battery is very essential. For cathode material, apart from the traditional and widely-used $LiCoO_2$, $LiFePO_4$ and so on, there are innovations that include the use of V_2O_5 . Researches have been done focusing on how to further improve the performance for V_2O_5 cathode in terms of different structure, forms or combination with other chemical molecules. This research paper will make a summary of the materials derived from traditional V_2O_5 as well as their performances.

Keywords: Lithium battery; Cathode material; V_2O_5 materials and performance

Publication date: July 2021; **Online publication:** July 31, 2021

1. Introduction

The development of high-performance lithium ion batteries is mainly limited by the relatively low capacity of the negative electrode and poor cycling stability. Considering the limitations of $LiCoO_2$, $LiMn_2O_4$ and other traditional cathode materials, the low theoretical capacity and multi-step synthesis requirements of $LiFePO_4$, these materials do not have advantages for flexible wearable electronic devices in the new era [1-2]. However, a new type of cathode material V_2O_5 with high theoretical specific capacity and abundant activity in nature appears to be a very appealing choice. V_2O_5 has a variety of derived materials which make it has a great research prospect. Vanadium-based compounds exhibit a range of oxidation states, including V^{5+} , V^{4+} , V^{3+} , and V^{2+} , making them feasible to composite with many other anions and cations to form vanadium oxides [3].

Poor cyclic performance is the most important problem for V_2O_5 materials and its derivatives. The most serious problem for traditional lithium battery cathode materials is that the long cycle stability, good rate capability, and high mass loading cannot be achieved at the same time [4], which is caused by the irreversible Li^+ intercalation at the deep discharge condition

In this passage, several different materials derived and improved from the original vanadium oxides compound in terms of their performance are concluded. These materials include V_2O_5 with HoMSs, O vacancies and so on, while also in different forms, such as in xerogel forms and in nanotube form. Many of them have significant improvement compared with traditional form considering in charge-discharge capacity and other means, but meanwhile perform poorer in other aspects, especially in the performance of stable cyclability.

2. Materials and Performances

2.1. V₂O₅ Nanotubes

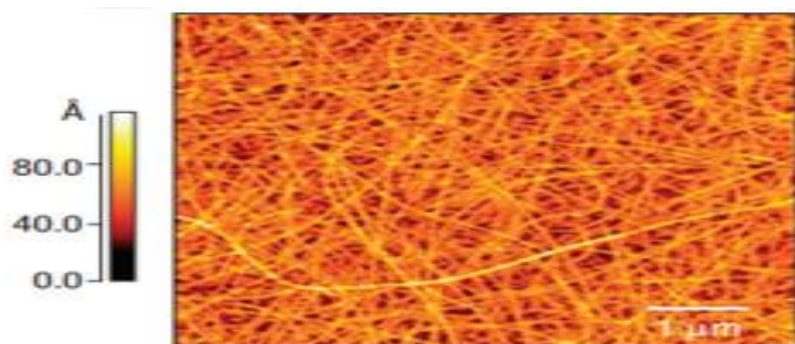


Figure 1. Images of V₂O₅ nanofiber ^[5]

V₂O₅ nanotube array has initial capacity of 300 mA h g⁻¹, which is almost two times higher compared to the initial capacity of the traditional V₂O₅ film, which is 140 mA h g⁻¹. Short diffusion distance and large surface area of the nanotube array are the main reasons for this improvement in capacity.

However, unstable discharge cyclability performance is still obvious (the capacity is reduced to 200 and 180 mA h g⁻¹ at the second and third charge and discharge), but there is still improvement compared with colloidal or ordinary V₂O₅ film (30% more power than traditional V₂O₅ film at the sixth charge and discharge) ^[5-6].

Newly reported improvement related to V₂O₅ Nanofibers includes V₂O₅/CNT (Carbon nanotube). **Figure 2.** shows the number of cycles in the relation with capacitance retention. V₂O₅/CNTs composites have good electrochemical stability, and after 5000 cycles, the capacitance loss is only 8.8%, which is a high result compared with other electrodes.

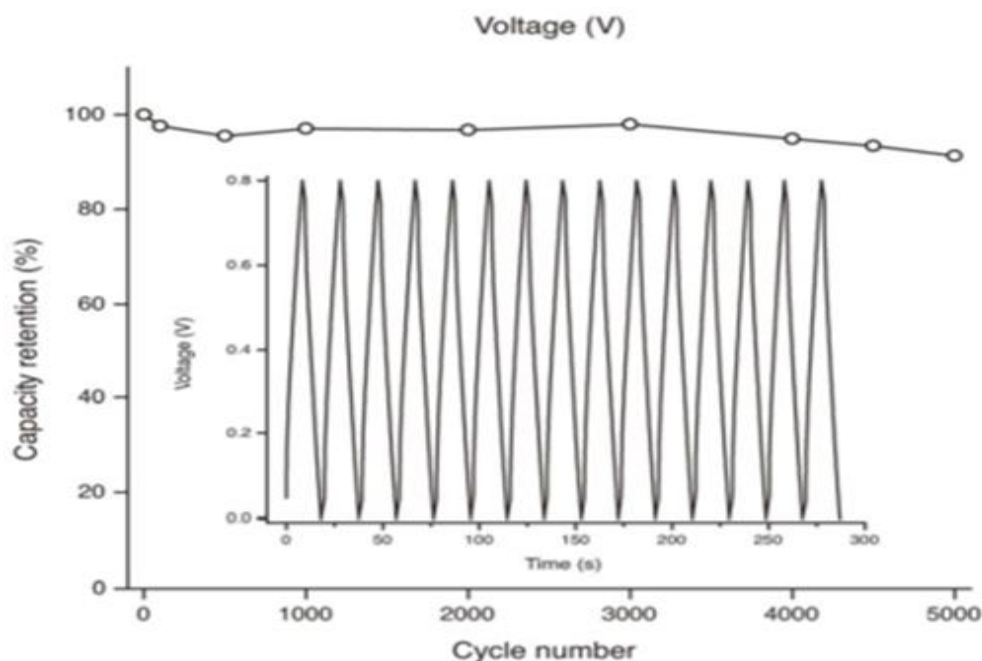


Figure 2. V₂O₅/CNTs capacity retention in relating with cycle numbers ^[6]

It was found that V₂O₅ /CNTs with weight ratio 0.5:1 had the highest capacitance among different ratios. Due to mutual penetration of carbon nanotubes and V₂O₅ nanosheets, the composite structure is layered porous. Based on the structure of V₂O₅, the conductivity of CNTs and the high capacity of V₂O₅,

V_2O_5 /CNT electrode has a power density (0.27 W cm^{-3}) and energy density (1.47 mWh cm^{-3}) [7].

2.2. V_2O_5 HoMSs (3D hollow multi-shelled structures)

The HoMSs, also known as 3D hollow multi-shelled structures, has more active sites and more surface-volume ratio can be provided for lithium-ion storage to improve the specific capacity of cathode. In addition, due to the shorter path needed to transport lithium electrons and ions and increased electrode-electrolyte contact area, HoMSs can make lithium ions enter lithium ions better, thus improving the rate capacity.

A 3D textile-based cathode electrode coupling a V_2O_5 -HoMSs active material with a metal fabric collector for good quality flexible lithium batteries has been reported by Zhu et al., [8]. The cathode electrode of the fabric is composed of single or multi-shell V_2O_5 HoMSs synthesized by STA (denoted as nS- V_2O_5 . The number n representing number of shells) for the active material, and cotton coated by nickel (reduced to Ni-Cotton) fabric for the use of mechanical support and conductive collector. Due to the advantages of the above HoMSs, the large surface area and flexibility shown of the Ni-Cotton structure, as well as the good combination of V_2O_5 HoMSs and Ni-Cotton, the 3S- V_2O_5 HoMSs/ Ni-Cotton electrode under the high-quality load of 2.5 mg cm^{-2} , it can maintain an astonishing capacity of $222.4 \text{ mA h g}^{-1}$ even after 500 charge and discharge cycles. This proved that it has good ability for repeated use, also solving the traditional problem of cathode material in terms of poor cyclability.

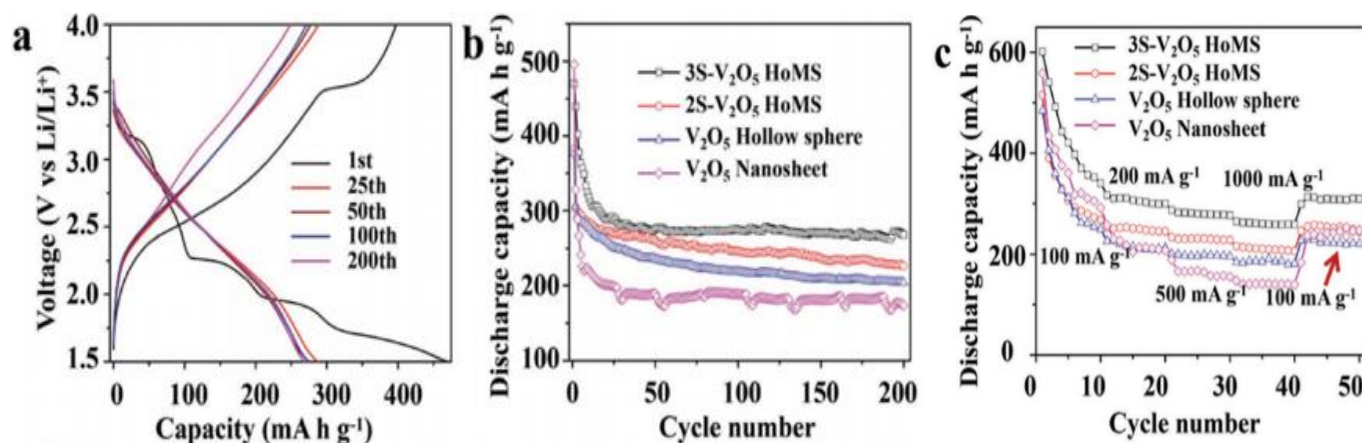


Figure 3. Note that V_2O_5 Hollow sphere also known as 1S- V_2O_5

Figure 3., Note that V_2O_5 Hollow sphere also known as 1S- V_2O_5 HoMS a) 1st, 25th, 50th, 100th, and 200th charge–discharge curves of 3S- V_2O_5 HoMSs/Ni-cotton. b) Cycling performance, measured at a current density of 500 mA g^{-1} , of V_2O_5 hollow sphere/Ni-cotton, 2S- V_2O_5 and 3S- V_2O_5 HoMSs/Ni-cotton, and V_2O_5 nanosheets/Ni-cotton fabric electrodes. c) Rate performance of V_2O_5 hollow spheres/Ni-cotton, 2S- V_2O_5 and 3S- V_2O_5 HoMSs/Ni-cotton, and V_2O_5 nanosheets/Ni-cotton fabric electrodes [8].

As shown in **Figure 3. c**, specific discharge capacity of 3S- V_2O_5 HoMSs electrode was 601.8 mAh g^{-1} under current density of 100 mA g^{-1} . That is much better compared with other traditional cathode material. Even when the current density increased to 1000 mA g^{-1} , there is still a high capacity of $264.6 \text{ mA h g}^{-1}$.

In **Figure 3. b**, the capacities of HoMSs and nanosheets after 200 cycles were respectively 268.3, 226.7, 204.0 and 173.9 mAh g^{-1} . Maximum specific capacity electrode is obtained using the 3S- V_2O_5 HoMSs/ Ni-Cotton. This is attributed to the fact that a larger surface area can be provided by 3S- V_2O_5 HoMSs and more active sites for lithium-ion storage, so specific capacity can be improved. Also, when compared with V_2O_5 nanosheets, HoMSs materials shown better cyclic stability and capacity, that is mainly due to some of the factors. Firstly, because of the pore structure, electrolyte permeates the inner shell better. Secondly, the thin shell reduces the stress caused by volume expansion and reduction, while also shortens the time needed for transportation Thirdly, multi-shell structures may provide more places to store lithium.

2.3. Orthorhombic phase V_2O_5 with O vacancies (denoted as V- V_2O_5)

V- V_2O_5 is also an appealing material available for use in lithium battery cathode. **Figure 4.** are SEM, TEM images showing pure V_2O_5 and V- V_2O_5 . From the graph provided, it is clear that both V- V_2O_5 and V_2O_5 have two-dimensional lamellar morphology. Using higher magnification SEM and TEM images, V- V_2O_5 has many deeper troughs on the surface and large surface fluctuations (**Figure 4. c, g, h**), whereas V_2O_5 is a slab fracture attributable to mechanical forces during sample preparation (**Figure 4. f, j, k**), the rough surface of V- V_2O_5 more effectively inhibits the accumulation of flakes, stores more electrolytes, provides more material-electrolyte contact area, and loosens mechanical strain resulting from insertion/disinsertion cycle of Li^+ compared with pure V_2O_5 [9].

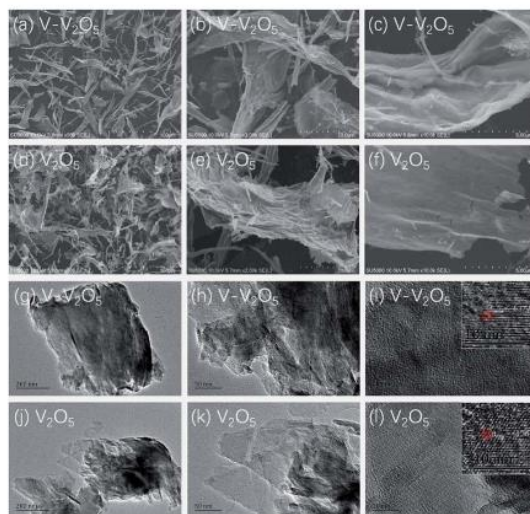


Figure 4. SEM, TEM samples of V_2O_5 and V- V_2O_5 [9]

According to Sun et al., at the current density of 200 mA g^{-1} , **Figure 5.** a shows the cyclic ability for both the V- V_2O_5 and the pure V_2O_5 electrode. Compared with pure V_2O_5 , it is clear that V- V_2O_5 shows better discharge capacity. Given current density of 1 A g^{-1} (**Figure 5. c**), maximum specific discharge capacity of V- V_2O_5 and V_2O_5 is respectively 230.2 and 256.6 mAh g^{-1} . The discharge capacity after 50 cycles are respectively 213.1 and 237.9 mAh g^{-1} , and the discharge capacity after 100 cycles are respectively 199.2 and 224.7 mAh g^{-1} . Insertion/ removal capacity of Lithium ions in V- V_2O_5 are always better compared with traditional V_2O_5 . The capacity retention rate of V- V_2O_5 still remains at 87.6% at the 100th cycle. Even at higher current density of 3 A g^{-1} , as shown in **Figure 5. d**, excellent discharge capacity stability is still shown on the graph, always higher than that of V_2O_5 , and remain at the value for approximately 150 mAh g^{-1} for all the cycle number smaller than 200.

Cyclic stability of V_2O_5 and V- V_2O_5 samples is compared for 1 and 3 g^{-1} current density (**Figure 5. c, d**). At 1 A g^{-1} , there is first increased and then decreased discharge capacity of V- V_2O_5 and V_2O_5 , the maximum capacity are found to be 218.4 and 200.6 mAh g^{-1} . During cycle measurement, the significant increase in capacity during the first few cycles can be attributed to electrode activation (electrolyte penetration and/or active surface increase). After 200 cycles, discharge capacities of V- V_2O_5 and V_2O_5 are respectively to be 189.3 and 172.4 mA h^{-1} . When 3 A g^{-1} is adopted, the capacity first increased slowly and remained stable for both two electrodes. Maximum discharge capacities of V_2O_5 and V- V_2O_5 are respectively 141.7 and 150 mAh g^{-1} . In the condition of hypoxia, V_2O_5 is easy to lose the O atom in crystal structure and form Oxygen vacancy. O vacancies acts as important role to help to reduce V^{5+} to V^{4+} , improve electron and ionic conductivity, also providing additional sites for lithium ions to embed in [10-11].

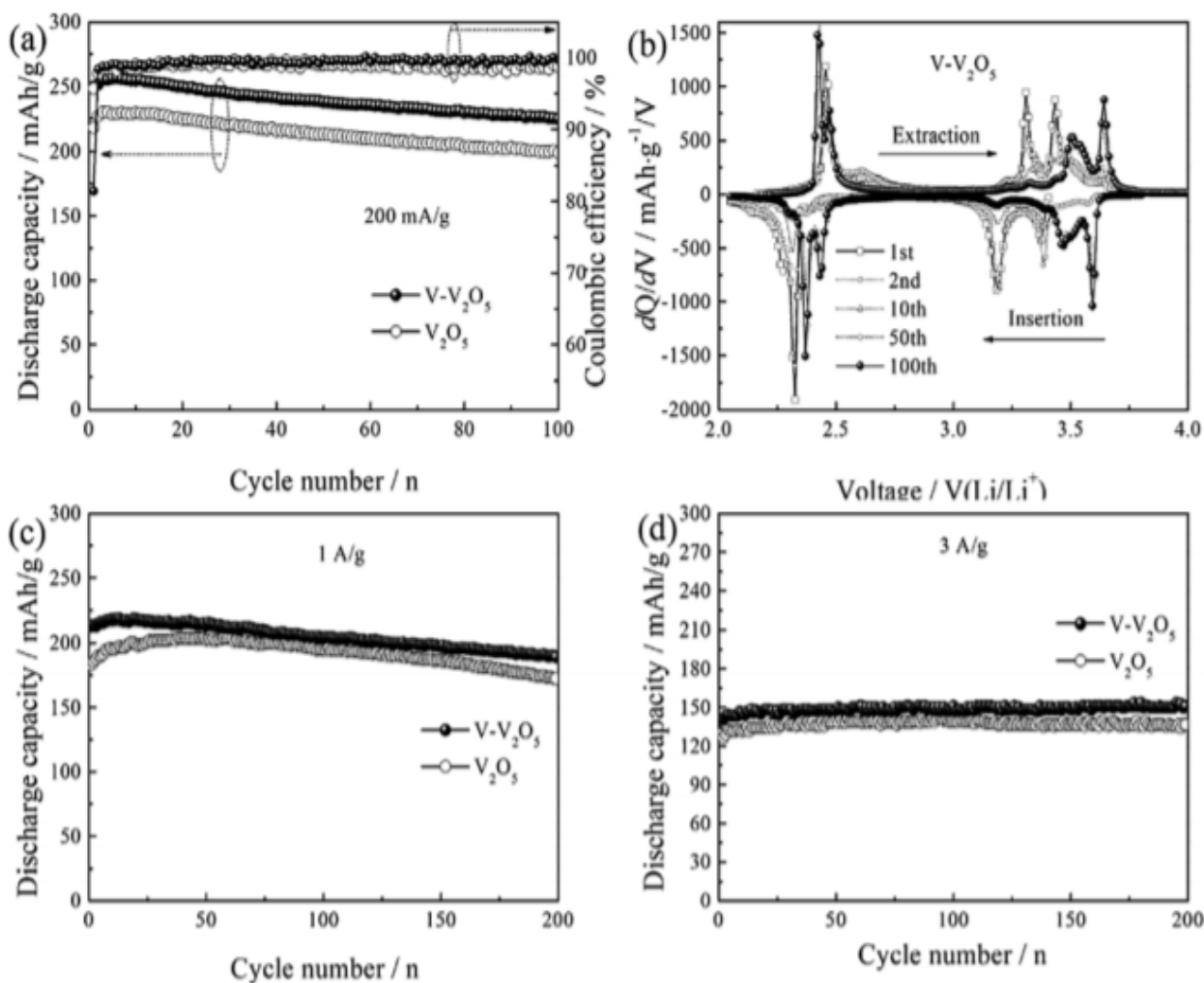


Figure 5. (a) V- V₂O₅ and V₂O₅ electrodes at a current density of 200 mA g⁻¹, measured for the cyclic performance; (b) At a current density of 200 mA g⁻¹, differential specific capacity plots of the V- V₂O₅ drawn with different cycle numbers, cyclic performance of V-V₂O₅ and V₂O₅, respectively, are drawn at a current density of (c) 1 A g⁻¹ and (d) 3 A g⁻¹ [9].

2.4. Li₂O-V₂O₅-SiO₂-B₂O₃ glass

Suitable cathode materials also include glass materials because of their controllable capacity by controlling the composition of the glass. In addition, glass materials ordered with short-range structure can have much improved dynamics, and facilitate electrochemical cycling.

SiO₂ has a very high melting point (1650±50°C), so for the Li₂O-V₂O₅-SiO₂ glass system, there is also a higher melting point. Therefore, a low melting point (450°C) B₂O₃ glass molding agent was used to reduce the melting point. In addition, because of phase separation, borosilicate glass has high ionic conductivity, and B₂O₃ can also reduce the tendency of crystallization in terms of the glass material.

In **Figure 6.**, 20Li₂O-30V₂O₅-(50-x)SiO₂-xB₂O₃ (x=10, 20, 30, 40) are named as LVSB10, LVSB20, LVSB30 and LVSB40 sample, respectively. The two graphs provide evidence for the cyclic stability for these cathode materials. **Figure 6.** a and b shows the relationship between voltage and discharge capacity. Under both circumstances, 50 mAh g⁻¹ density is adopted. It is find that under the 1.5V to 4.2V voltage range, four samples display poor capacity of charging. The discharge capacities of LVSB10, LVSB20, LVSB30 and LVSB40 were 123.7 mAh g⁻¹, 51.5 mAh g⁻¹, 37.9 mAh g⁻¹ and 19.5 mAh g⁻¹, respectively.

With high V^{4+} ratio, in the LVSB10 sample, it has higher initial discharge capacity compared with that in other samples. Plus, the more number of V^{4+} , the smaller polaron jump can be generally shown, thus achieving higher conductivity [12].

However, the capacity of the glass cathode material decreases rapidly. The capacities of all four LVSB materials undergoes rapid decrease after 50 cycles. The capacity retention rates were hardly above 50%, showing not stable cyclability when more charge and recharge cycles are being repeated. In **Figure 6. b**, the results shows that LVSB glass has electrochemical activity, but poor cycling performance for glass cathode material, mainly caused by the low electron conductivity due to the large particle size and its volume may also have changed during the ion and electron extraction or insertion.

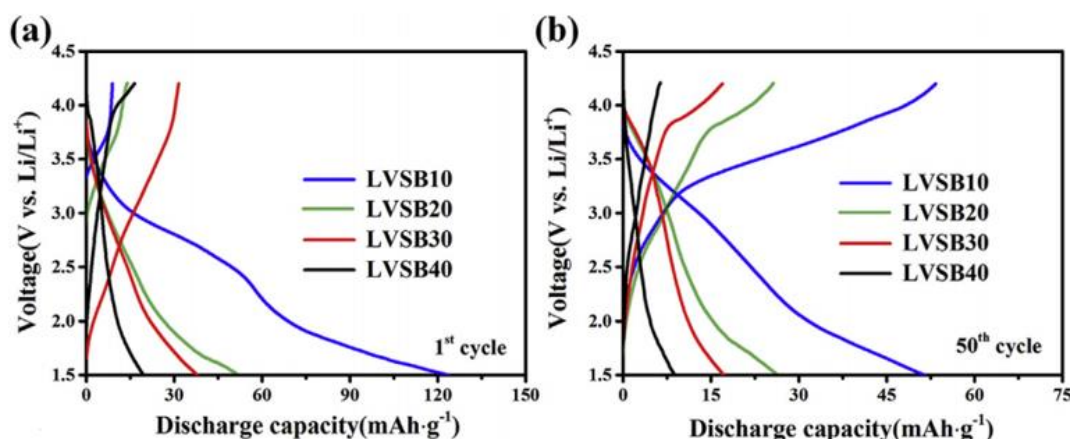


Figure 6. Charge and discharge curves for (a) 1st cycle, (b) 50th cycle using LVSB10, LVSB20, LVSB30 and LVSB40 as glass samples [12].

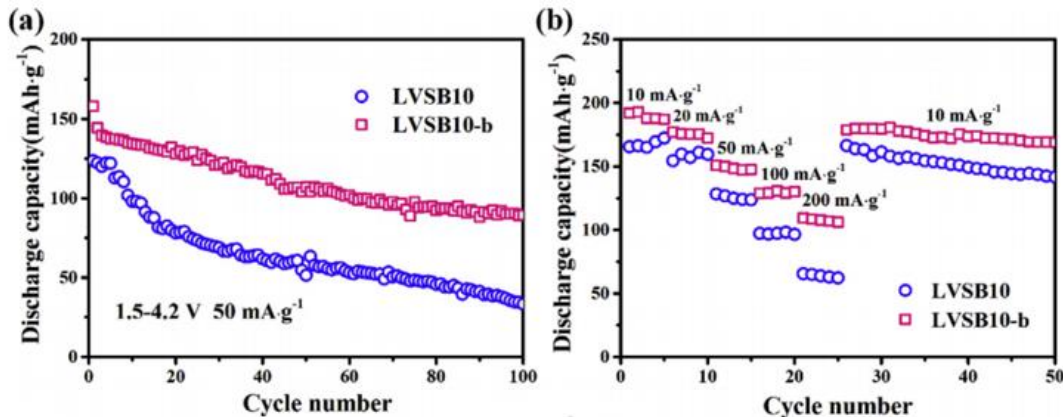


Figure 7. Cycle number versus discharge capacity of LVSB and LVSB-b for both fixed current density(a) and changing ones (b)

LVSB10-b can be made by milling the LVSB 10 sample, which this process can make LVSB 10 particle smaller, creating LVSB10-b with smaller particle. Cyclability ability of both LVSB and LVSB 10-b are first going to pass through a stable voltage, which ranges from 1.5V to 4.2V to give stable current density of 50 mA g⁻¹. In this case, it can be shown from **Figure 7. a** that LVSB 10-b obviously win in every cycle number under 100 in terms of discharge capacity. For the 100th cycle, LVSB 10-b still reaches discharge capacity of approximately 100 mAh g⁻¹, still maintain the capacity retention of nearly 70%, while the value for LVSB of discharge capacity at 100th cycle is only approximately 30 mAh g⁻¹. In **Figure 7. b**, providing the changing current density, LVSB 10-b still shows better performance under the condition of different current density. The main increase in cyclability is mainly due to the impedance of charge transfer

is largely decreased, and lithium ion diffusion is rather easier. It is conjectured that due to the decrease in particle size for LVSB 10-b, both electron and lithium ion transporting pathways can be shortened, so the conductivity of the cathode can be effectively improved.

2.5. V₂O₅ xerogel

V₂O₅ xerogel can be directly made from traditional V₂O₅ crystals. The xerogel is obtained by adding molten vanadium oxide that is heated to 800°C into water. According to Huguenin et al.,^[13] the electrochemical performance analysis showed that V₂O₅ xerogel was a suited lithium battery cathode material choice, with a reduction potential 3 higher than that of lithium, an energy density of about 600 Wh kg⁻¹, and a specific capacity of about 250 Ah kg⁻¹. However, the poor cyclability that decreases obviously with the increase of the number of cycles for vanadium oxide xerogel still exists.

film	annealing gas	interlayer spacing (Å)	grain size (nm)
1	3 h air	11.0	14.3
2	0.5 h air + 2.5 h N ₂	11.1	11.6
3	2.5 h N ₂ + 0.5 h air	11.2	6.4
4	3 h N ₂	11.5	5.1

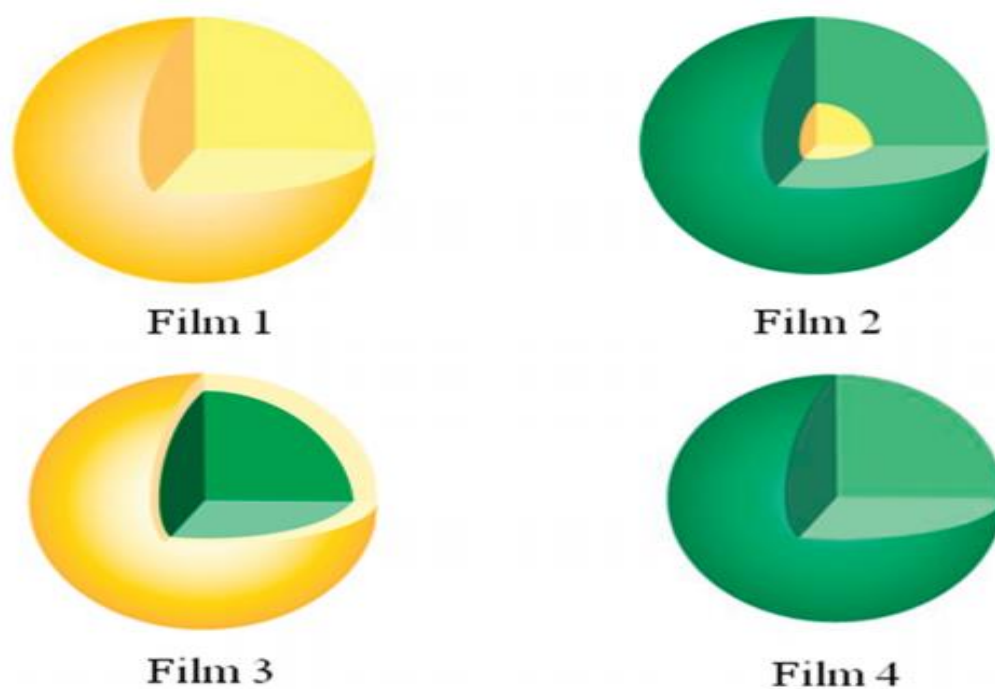


Figure 8. Different composition of V₂O₅ films, which are annealed with varying N₂ and air composition. Presence of V⁵⁺(yellow) and V⁴⁺(green) can also be known from the graph^[13]

Four films can be derived from the vanadium oxide xerogel in terms of different composition, as shown in **Figure 8**. on the left. These four films have different grain sizes and also have different chemical properties. Reduction is induced by N annealing, causing yellow V⁵⁺ ions to green V⁴⁺ ion. As shown in the graph, in film 1, there is no or very little V⁴⁺; in film 2, V⁴⁺ ions (green exterior) covers the surface of the film. There is many V⁴⁺ ions inside the film 3 (green), but due to re-exposure to air, V⁴⁺ on the surface of the film is oxidized to V⁵⁺; There are V⁴⁺ ions in film 4 as in film 3, but because only N₂ annealing is

applied, there is no V^{4+} reoxidation on the surface ^[13].

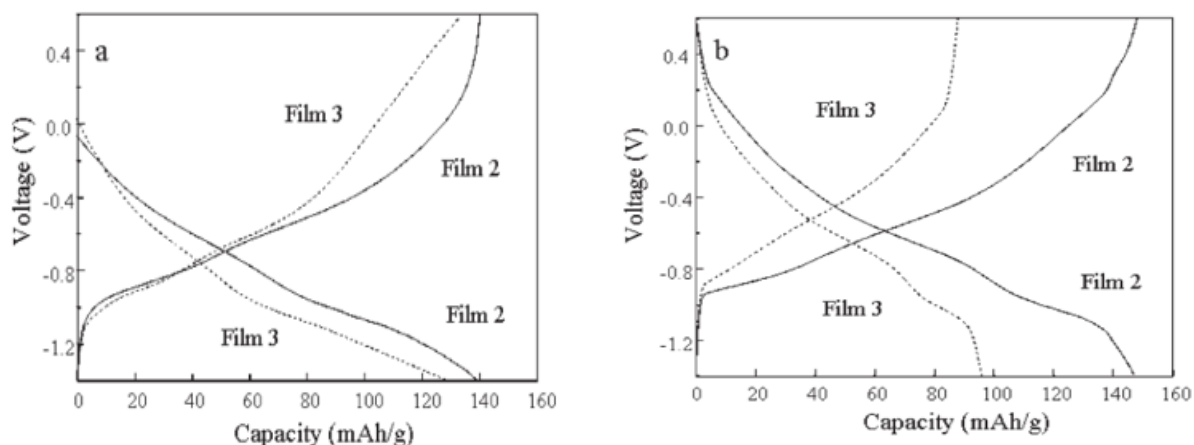


Figure 9. Films 2 and film 3 under 600 mA g^{-1} current density of V_2O_5 at (a) 1st (b) 30th cycles for air and N_2 condition at 300 degrees Celsius for 3 hours (0.6V to 1.4V) ^[13]

Figure 9. is the graph that shows at the constant current density for 600 mA g^{-1} , the voltage-capacity relationship for the first and 30th CP curves. In Figure 9a, the initial CP curves of film 2 and film 3 start at $\sim -0.07 \text{ V}$ and $\sim 0.03 \text{ V}$, respectively. Compared with air-annealed films, the charge-discharge curves of both films are inclined and have clearer platform. Because of the intercalation mechanism of the solution, film 2 with low crystallinity has the discharge capacity of 139 and 137 mAh g^{-1} , and that of film 3 is respectively 129 and 133 mAh g^{-1} . However, what is appealing is that film 2 actually shows very small irreversible capacity for only 2 mAh g^{-1} . This proved film 2 to have very good reversibility. In **Figure 9. b**, for the 30th cycle, film 2 also displays very small irreversibility for only 1 mAh g^{-1} , while that of film 3 reaches 8 mAh g^{-1} . Using these data, we can conclude that in contrast with film 3, which degrades its capacity seriously within 30 cycles, film 2 shows very good coulomb efficiency with little irreversible capacity, and also better discharge capacity.

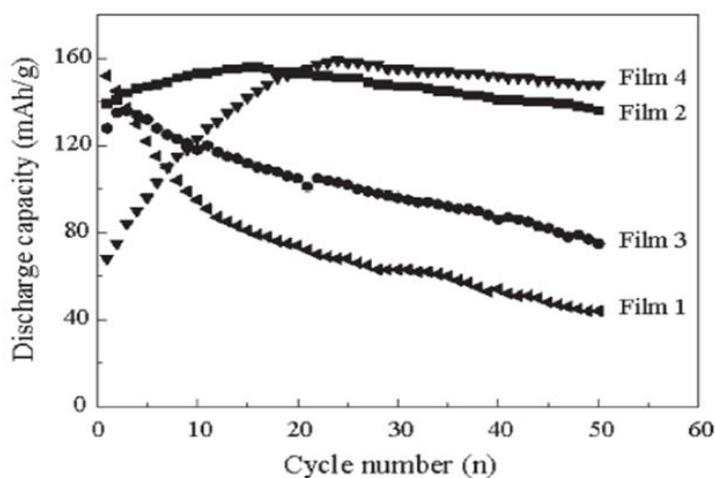


Figure 10. Discharge capacity versus cycle number for all the 4 films, with same condition applied in **Figure 9.** ^[13]

In **Figure 10.**, the discharge capacity versus cycle number graph is drawn in order to show the four film's stability in discharge capacity maintenance. Under the condition of 600 mA g^{-1} current density condition for 50 cycle numbers, film 2 in the four lithium ion intercalated films displays best cyclic stability.

With an initial around 140mAh g⁻¹, capacity, its capacity slightly improved in the following several cycles, and reach a maximum discharge capacity for cycle number 15, and then followed by a mild decline after 15 cycles. At cycle number 15, the capacity still remains high at 136 mAh g⁻¹, which shows very high coulomb efficiency for approximately 98 percent. Film 4 also display similar cyclability properties. Discharge capacity rise relatively fast with cycle number at first, with initial value about 68 mAh g⁻¹. Although a slightly decline follows after around 24 cycles, final discharge capacity after 50 cycles still reaches 148 mAh g⁻¹. Film 3 shows good initial discharge capacity, but it decreases fast and after 50 cycles it only reaches 75 mAh g⁻¹, which is quite low with maintenance of about 60% of initial value. Capacity degradation of film 1 is more severe. According to Liu, et al, the advantage in film 2 is found attributed to both more surface defects as well as larger size of grains. In contrast, for film 3, it is opposite with film 2 with less surface defects, but smaller size of grain. Both film 2 and film 4 have surface defects, their good performance shows the existence of surface defect is very essential for a good cyclic stability.

2.6. Aniline polymer (PANI)

The combination with aniline polymer creates new path that are parallel to vanadium oxide chain, and largely adds convenience for the transport of electrons. There exists space charge effect between PANI chain, which serves as conductive phase, and vanadium oxide itself. The chains are held together by the increased interface area created by hydrogen bonding (NH—OV) between vanadium oxide and PANI, resulting in a greater effect on the electron conductivity [13].

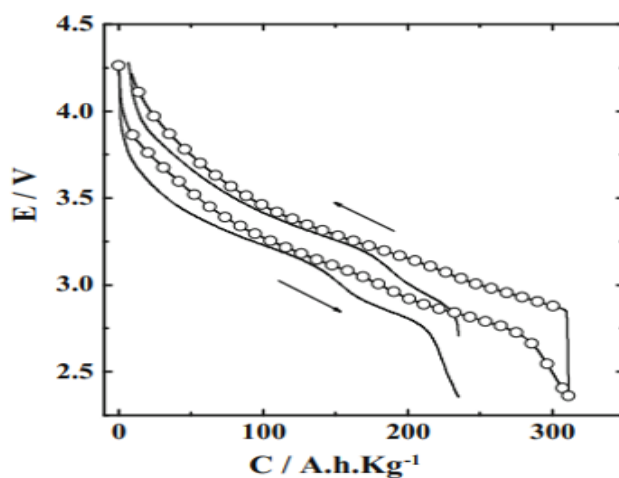


Figure 11. In condition of 0.5M LiClO₄, the Chronopotentiometric curves for [PANI]_{0.3}V₂O₅ (line with circle) and V₂O₅ (solid line) [14]

As shown in **Figure 11.**, V₂O₅/PANI shows better ability of lithium ion diffusion, and compared to the normal V₂O₅ xerogel, it also has better conductivity of electrons. That is caused by the better charge capacity (313 Ah kg⁻¹ for [PANI]_{0.3}V₂O₅ and 234 Ah kg⁻¹ for V₂O₅) [14]. Huguenin et al. also find that in the condition of [PANI]_{0.3}V₂O₅, Lithium ions are the easiest to diffuse in the battery. More results show that when the molar ratio of PANI is 30%, the capacity ratio of V₂O₅/PANI nanofibers is stable at about 300 mAh g⁻¹. The morphology of V₂O₅/PANI did not change significantly after 10 charges and discharges, but structural defects were found when only nanostructures were used.

3. Conclusion

In conclusion, it is found that the various derivatives for the original V_2O_5 compound are found to have promising implication possibilities. Most of the improvement focus on how to increase the diffusion of ions and electron in those cathode materials and the surface defects vacancies in order to increase the diffusion rate and to increase its capacity, while improvements are also made in order for increasing cyclability performance over charges and discharges. Samples such as V_2O_5 xerogel are easier to made while also have a better performance in terms of cyclability and discharge capacity. LVSB-10b combines vanadium oxide into glass compound and also shows promising future developments. Best ratio of these derived vanadium oxide compounds has also been discovered in terms of composition in cathode to maximize their performance. It is believed that V_2O_5 will achieve more developments in the near future and be able to play an important role in lithium battery cathode.

Disclosure statement

The author declares no conflict of interest.

References

- [1] Hatchard TD, Dahn JR, 2004, J. Electrochem. Soc, 151(6): A838.
- [2] Marom R, Amalraj SF, Leifer N, et al., 2011, A Review of Advanced and Practical Lithium Battery Materials. Journal of Materials Chemistry, 21(27): 9938-9954.
- [3] Karapidakis E, Vernardou D. n.d., Topic review Vanadium Oxides Subjects, Chemistry, Applied View times: 18.
- [4] Tomaszewska A, Chu Z, Feng X, et al., 2019, Lithium-ion Battery Fast Charging: A Review. E Transportation, 1: 100011.
- [5] Gu, Gang, et al., 2003, “ V_2O_5 Nanofibre Sheet Actuators.” Nature Materials, 2(5): 316-319.
- [6] Gamze Y, Chun X, Lu, 2016, “High-Performance Solid-State Supercapacitors Based on V_2O_5 /Carbon Nanotube Composites.” Chem Electro Chem, 3(1): 158-164.
- [7] Zhu Y, et al., 2020, “ V_2O_5 Textile Cathodes with High Capacity and Stability for Flexible Lithium-Ion Batteries.” Advanced Materials, 32(7): 1906205.
- [8] Sun Y, Xie Z, Li Y, 2018, “Enhanced Lithium Storage Performance of V_2O_5 with Oxygen Vacancy.” RSC Advances, 8(69): 39371-39376.
- [9] Khemchand D, et al., 2012, “Synthesis and Characterization of Self-Assembled Nanofiber-Bundles of V_2O_5 : Their Electrochemical and Field Emission Properties.” Nanoscale, 4(2): 645-651.
- [10] Roberta V, et al., 2018, “On the Strange Case of Divalent Ions Intercalation in V_2O_5 .” Journal of Power Sources, 407: 162-172.
- [11] Zhao EL, et al. 2019, “Electrochemical Performance of $Li_2O-V_2O_5-SiO_2-B_2O_3$ Glass as Cathode Material for Lithium Ion Batteries.” Journal of Materiomics, 5(4): 663-669.
- [12] Liu D, et al., 2011, “Enhanced Lithium-Ion Intercalation Properties of V_2O_5 Xerogel Electrodes with Surface Defects.” The Journal of Physical Chemistry C, 115(11): 4959-4965.
- [13] Huguenin F, Martins AR, Torresi RM, 2018, Nanocomposites from V_2O_5 and Lithium-Ion Batteries. In Nanoenergy, Springer, Cham, 223-249.
- [14] Huguenin F, Torresi RM, Buttry DA, 2002, Lithium Electro-Insertion into an Inorganic-Organic Hybrid Material Composed from V_2O_5 and Polyaniline, J Electrochem Soc, 149: A546.

Comparison of the Development of TikTok and Bilibili

Yiting Sun*

Southwest Weiyu Middle School, Shanghai, China

*Corresponding author: Yiting Sun, lynnlin@xyzrgroup.com

Abstract: According to the comparison between TikTok and Bilibili in five aspects, TikTok is far more than Bilibili in terms of user flow and business model. However, TikTok still has some disadvantages, such as the failure to provide high-quality short videos or the lack of development prospects for creators. TikTok and Bilibili are two related but different video platforms. Through the comparison between them, we can intuitively understand the problems faced by the two companies and predict the developmental trend of the two in the future. People can clearly understand the development and future trend of entertainment video platforms through the comparison between the two. The author thinks, TikTok will continue to generate high revenue with high traffic, and if Bilibili continues to produce high-quality videos and tries to break into the market, it will be able to gain a foothold like Youtube.

Keywords: TikTok; Bilibili

Publication date: July 2021; **Online publication:** July 31, 2021

1. Introduction

In 2021, the number of people using the Internet worldwide has reached 4.66 billion. In the Internet era, there is an increasing number of people use various online platforms for social entertainment. TikTok, the leading social software for short videos, has seen its active users grow from 250 million in 2019 to 400 million in 2021. However, Bilibili, another popular video website among young people, has also attracted the attention of a large number of people, and the number of active users has surpassed the iQiyi, Tencent, and other well-known video software. In order to study their development differences and future development prospects, the author made an analysis based on the audience, main business content, business model, ecological differences between creators, and the barriers between Bilibili and TikTok. The conclusion is that for enterprises, TikTok will always win with high traffic and high profit, but from the perspective of creators of the two platforms, B has greater potential.

2. Data and Method

2.1. The audience of TikTok and Bilibili

Bilibili is currently trying to develop out of the wall of the quadratic elements. The users are mainly divided into two main bodies: the core users of the quadratic elements and the general quadratic element users. The users are also divided into three groups according to their functions in Bilibili. First group is content-curators, the core members of Bilibili, who carry or self-produce videos and upload them to the platform for everyone to watch to get revenue. The second group is internet anchors who get profits through live broadcasting and interaction with viewers. The third group is video consumers, the main source of benefits for content-curators and anchors, who browse and watch ordinary videos and live broadcasts, and providing likes, coins, shares, comments, etc. Bilibili is a platform highly gathered by the young generation. About

60% of the users are 20-29 years old, and the rest of the 30-plus age group is no more than 15% ^[1]. In addition, there is a gender imbalance of Bilibili, women make up 30 percent of the total, while men make up a staggering 70 percent. Besides, Bilibili's main users are in the first and second tier cities in the coastal region and a few central cities. Nearly 70% of users are from first tier cities. According to the provinces where the users of Bilibili reside, the top three provinces are Guangdong, Jiangsu and Shandong respectively. The users of Guangdong account for 12.4% of the total users, and the users of Jiangsu account for 10.2% ^[10]. TikTok users are categorized into three divisions according its users' functions. The first group is called KOL (Key Option Leader), who were recruited by TikTok company in the early stage and trained for creating videos for their strong desires to express themselves, their high enthusiasm for music, creative video production, editing and appealing audience. The second group is called "follower-type users," who appreciate the talent wonderful works of KOL and are eager to be able to shoot the same cool video in TikTok through several methods step by step: finding their idol in their heart on the platform, following them, learning from them, and participating in the challenging topics of TikTok. The third group is called "browsing users," like video consumers in Bilibili, who watch videos created by KOL or follower-like users and share videos with friends. However, the users of TikTok is more comprehensive and balanced. First, it aims at all ages. The margin of error for all the different age groups after age 19 was between 10 and 20 percent ^[2]. Second, the proportion of male and female users of TikTok is fairly equal. According to the data from QuestMobile, men make up 52% of the total users and women 48% of the total users. Third, TikTok is welcomed by users who reside in provinces in wide ranges, from first-tier cities to lower-tier cities, including cities below third-tier. The average error of the number of users from first-tier cities to cities below fifth-tier cities is not large, between 10%-25%, among which third-tier and fourth-tier cities account for the highest proportion, accounting for 25% and 22% of the total, respectively ^[11]. However, the disadvantage of TikTok lies in its strong randomness of users, while most of the users of Bilibili are loyal users, which is reflected in the high distributions of a large number of core quadratic users.

2.2. TikTok and Bilibili content

At the early stage, the content of TikTok videos are various and are constantly diversifying, thanks to the creativity of users. TikTok videos are divided into 14 categories: entertainment, knowledge, quadratic elements, games, food, sports, fashions, dance, music, information, technology, living, funny videos and VLOG. Also, the TikTok is not only popular for Chinese people, because it can cross cultures, classes, and even languages. According to the TikTok download data by countries in 2019 ^[3], TikTok is the fourth most downloaded app globally, just behind Facebook. India has seen 190.6 million downloads, and the US has seen 41million downloads. TikTok's videos are attracting and make users easily addicted in them because the platform can push corresponding videos according to customers' preferences for watching short videos, ensuring users' sense of experience. Thus, people's acceptance of TikTok videos is quite high. On the other side, Bilibili videos can be clearly divided in to 15 areas: animation, music, dance, games, knowledge, technology, living, ghost and animal, fashions, entertainment, information, films and television, food, funny videos and VLOG. Since Bilibili stands as a quadratic element leading platform for the cultural community and video, so users' interests are more central and limited in quadratic elements, which is the reason why Bilibili are largely gathered by young generations. Bilibili's popularity is largely due to the biggest advantage of no video advertising and content of UGC. The problem is the quadratic-element contents and memes which are prevalent in Bilibili might not be understood and recognized by general groups, who are not familiar with the quadratic-element circle. Therefore, the range and variety of Bilibili users is much smaller than that of TikTok. In attempt to address this problem, Bilbili is taking action to develop in the direction of diversification. In addition to quadratic-element animation, the videos of Bilibili are breaking their way to knwoledge, technology, and vlog-type fields according to the speech of Chen Rui, the founder

of Bilibili ^[4]. Nevertheless, from the aspects of the quality of videos, TikTok is with disadvantages. What TikTok lacks is that it is difficult to show a 15-second video with high quality. In contrast, videos of Bilibili, usually lengths from 15 seconds to even hours, are all uploaded by professional users (content-curators).

2.3. The business Model of TikTok and Bilibili

There are four aspects for analyzing business model of TikTok. Firstly, according to the statistics from CNNIC ^[12], China's netizens aged 10-39 are the main Internet users, accounting for 73 percent of the total, and the 20-39 age group accounts for up to 20 percent. Douyin meets the spiritual needs of young people through the value proposition of the new generation, enabling them to discover their true inner selves and have a better chance to be recognized by the outside world. Therefore, Douyin is favored by the post-80s, post-90s and post-00s, which brings out potential business values. Secondly, KOL, the main groups of TikTok users who spread their talented creations and performance, are highly imitated and followed by the rest groups of users. Though this method can bring out high traffic, the types of videos in TikTok will gradually appear monotonous, boring, and are easy to produce aesthetic fatigue, as the method limits users' originality. Thirdly, the short video format in TikTok greatly reduces the time cost of users. Actually, from a micro point of view, Tiktok does take up a lot of fragmented time, such as waiting for the subway or bus, or going to bed. As the data shown from iiMedia Research ^[13], of the 700 million people who use short videos, 37.2 percent of users increase their use of TikTok in 2021, and 31 percent of TikTok users stay the same in 2021. Thus, time spent by the public is on the rise. Fourth, by looking at TikTok's profit model, TikTok makes most of its fortunes from advertising and in-app purchases, as shown by financial statements ^[5] that reported \$88.5 million in revenue from advertising and in-app purchases in the fourth quarter of 2019, twice as much as in the third quarter of 2019 and six times as much as in the fourth quarter of 2018. On the other hand, there are three aspects to analyze business model of Bilibili. Firstly, the biggest advantage of Bilibili lies in its core competitiveness. Different from iQiyi, Tencent, Youku and other video websites, Bilibili is like a cultural community in essence, which has cultivated a group of highly loyal users. In addition, Bilibili strengthened the establishment of language within the circle by means of the interaction represented by bullet screen. Site Bilibili members enjoy uploaded video updates, on-demand advertising ways to promote individual users of the site monthly contact. Secondly, Bilibili adopts the method of business combination, mainly focusing on the offline activities of the quadratic element and the gradual development of peripheral products. Bilibili uses labels to mark video contents, making it form a different cultural circle. The fourth aspect is the profit model of Bilibili. In fact. The revenue of Bilibili at the beginning came from Baidu and Google. However, with the continuous expansion of user traffic, the website with huge traffic naturally gives rise to many profit points, which can be roughly divided into games, live broadcasting, advertising and others. Advertising is the earliest income of Bilibili site, and the original position is mainly concentrated in the content page player barrage pool, with multiple game advertisements; Website home page advertising, mostly diffuse and other websites around the piracy; Content page player ads, mostly for most game agencies game ads. Nevertheless, the ads now are eliminated except those from barrage pool, so advertising is no longer the main source of making profits. Now, Bilibili make a fortune largely from games. Because of the vertical concentration of users on Bilibili and the high retention and conversion rate, Bilibili, as a cultural area of two-dimensional aggregation, should not be ignored most definitely is the game in ACG. In addition to promoting the game in the content curators' videos, Bilibili will be jointly operated with the game developers after the invention of the game, and then the revenue will be paid according to the agreed proportion. According to the financial statements from Bilibili ^[6], Bilibili's profit income from developing and distributing games, is 873 million yuan, accounting for more than 64% of the total, most of which comes from its sole agency of fate/grand orders ^[5]. Now, version 2.0 of this game also led to a certain growth of the total revenue. Revenue from direct broadcast

and value-added services reaches 292 million, accounting for 21% of the total. The remaining 15% of the revenue comes from advertising, e-commerce, and other income. Consequently, in terms of revenue, TikTok is far ahead of Bilibili, but we can clearly see that the two apps have different operating models and aims, both of which benefits and fit the promotion of these two apps.

2.4. Ecological differences between TikTok and Bilibili creators

Compared with each other, in fact, creators in the Bilibili are to benefit more. The platform provided by Bilibili has a large number of loyal users, high user engagement, and high fan activity, but for TikTok, a short 15-second video with a large number of relevant notifications makes it difficult for users to connect closely with the creators. According to the 2019 TikTok Data Report ^[7], TikTok has 400 million daily active users. According to the Q3 2019 financial report, TikTok has only 376 million daily active users, which is 9% of TikTok's total daily active users. However, the point is that 9% of Bilibili curators contribute 12% of its followers, indicating that Bilibili has a 33% higher chance of getting attention from users than TikTok. In addition, the continuous expansion of Bilibili this year ^[9], from the original main content of quadratic elements to the knowledge area, gives more creators the opportunity and space to show. For example, the knowledge area can be said to be a dark horse in the whole Bilibili this year. Up owner Luoxiang and Crayon and Xiaoxun are good examples, both of whom are followed by more than 5 million fans. In the past two years, however, TikTok has also hatched a strategy for its creator ecosystem. At the TikTok Creators Conference in 2021 ^[8], Zhang nan, the CEO of TikTok, said that the platform will hatch a “creator Growth plan” that aims to encourage at least 10 million creators to earn profits from TikTok. In the past two years, the ecosystem of creators has been in a state of growth. Among the creators with tens of thousands of followers on TikTok, 88% are from ordinary original creators, while among the creators with millions of followers, 85% are also from ordinary original creators. In addition, TikTok’s live-stream delivery to e-commerce has also grown rapidly, as TikTok has lowered the threshold for e-commerce to 1,000 followers. In this year's “515 Ace Live Studio event,” more than 1,700 million content creators have participated in the livestream, covering video, beauty, jewelry, clothing, and other fields. As data shows ^[7], creators on TikTok’s chart of celebrities saw their per capita income double. Therefore, to sum up, the loyal users of Bilibili can bring a lot of benefits to creators, while the measures TikTok has implemented in the past two years are also assisting in creators and improving their ecology.

2.5. The Barriers of TikTok and Bilibili

TikTok’s core value to users is to provide the most efficient means of entertainment, which means that these means of entertainment will not be permanent, because, with the development of The Times, more efficient ways of entertainment that we can’t imagine will appear in the future, and which would be the substitute of TikTok. The barrier of Bilibili is the content ecology composed of creators and users. With the increase of new creators and users, the content of videos will also change. For example, many funny memes are actually created by ordinary users. Such baggage and meme will be replaced quickly as time goes by. What Bilibili can do is that it can advocate high-quality videos and accumulates high-quality content like YouTube, Bilibili will be at the same station like it. Most importantly, the expanding of fields of videos of Bilibili will determine whether it can have greater development in the future. Thus, in order to have greater development, TikTok should be more original in providing means of entertainment and Bilibili should expand the variety of its videos.

3. Results and Discussion

3.1. Comparison and Developmental Prospect of TikTok and Bilibili

If TikTok and Bilibili compete with each other, Bilibili has totally no advantages at all, but the stability and

liquidity of Bilibili have competitive powers. According to the ecological differences between creators of the two apps, both TikTok and Bilibili have developmental opportunities in different aspects. Bilibili provides creators with a platform with higher fan stickiness and larger creative space, while TikTok provides creators with more training opportunities and spaces for growth. While the main threat to Bilibili is its disruptive process, the threat to TikTok is whether there are new scenarios that can capture users' attention. In terms of the profit model, the profit of TikTok is significantly higher than that of B station. Therefore, Bilibili needs to find new ways to make money, such as vigorously supporting the live broadcasting industry and making a fortune by seizing the advantages of Bilibili, without breaking the cultural value and community atmosphere advocated by Bilibili. Consequently, what has to conclude from the comparison of the two apps is that both of them have their unique features, and TikTok is more dominant, but as seeing both platforms' measures for improvement, their future competition will be unknown and unexpected.

4. Conclusion

To conclude, by weighing both TikTok and Bilibili in 5 aspects, TikTok is more dominant than Bilibili, especially indicated by measurements from business model. However, by taking the long view, the author can't evaluate developments of both apps. It is safe to say that both platforms are having attempts to reform and innovate to different ways: Bilibili is expanding its ranges of video varieties and TikTok is assisting content-curators' growth. All in all, we can have good expectation toward both TikTok and Bilibili which might build more glittering things.

Acknowledgments

What has to be admitted is that it is hard to forecast the future development of TikTok and Bilibili accurately. Statistics for analyzing TikTok and Bilibili before 2018 have not been included in the analyzing part, which may somewhat influence the results.

Disclosure statement

The author declares no conflict of interest.

References

- [1] Li Y, 2019, Report of Bilibili User Requirements Analysis, October 11th, 2019
- [2] QuestMobile, 2020, TikTok User Portrait Report in 2020, Jan.
- [3] App Annie, 2019, TikTok Global User Statistics Collection.
- [4] Bilibili, 2020, Transcript of Chen Rui's speech, Sept, 28th.
- [5] Wu Dong, 2019, Unaudited Financial Statements of Bilibili, May, 16th.
- [6] JIn Niu, 2020, TikTok Data Report from Sensor Tower, Jan, 19th.
- [7] TikTok, 2019, TikTok Data Report.
- [8] TikTok, 2019, Transcript of TikTok Creators Conference.
- [9] Ka Si Data, 2020, Bilibili Developmental Analysis.
- [10] Jiang Z, 2020, Ranking of Bilibili Users by Provinces, May, 8th.
- [11] QuestMobile, 2021, Attribute Analysis of Tiktok Users, Jan.
- [12] CNNIC, 2020, Statistical Report on Internet Development in China.
- [13] iiMedia Research, 2020, Study of Duration of Different Types of Short Video Users.

Discussion on the Application of Enterprise Business Intelligence Data Analysis System

Ning Yang*

Weifang Special Steel Group Co., Ltd., Weifang 261200, Shandong Province, China

*Corresponding author: Ning Yang, yang6168@139.com

Abstract: Enterprise Business Intelligence (BI) system refers to data mining through the existing database of the enterprise, and data analysis according to customer requirements through comprehensive processing. The data analysis efficiency is high and the operation is convenient. This paper mainly analyzes the application of enterprise BI data analysis system in enterprises.

Keywords: Enterprise; BI data analysis system; Application

Publication date: July 2021; **Online publication:** July 31, 2021

1. Introduction

In the era of data, the current development of enterprises has a large amount of data information that will be generated in various links such as procurement, production, operation and sales. This plays an important guiding role in the development of enterprises. Through the application of information technology, the massive historical data are integrated and analyzed. This is to summarize the experience and lessons in each link of the enterprise, as well as use the data to guide the decision-making and operation mode of the enterprise, and predict the future development of the enterprise, which is conducive to promoting the better development of the enterprise. BI data analysis system is the key to data processing in all links of enterprises. It is more and more frequently used in enterprise data analysis, and can form an index analysis system through data analysis to provide corresponding reference for enterprise development decision-making.

2. Project content on the application of enterprise BI data analysis system

With the development of the enterprise, the business items and business scale of the enterprise will gradually increase. At the same time, the production, operation and sales outlets of the enterprise are also expanding. The enterprise needs to combine a large amount of data generated in each link to build an information database system to make statistics on the data, so as to meet the needs of the development of production and operation of the enterprise. However, with the increase of data, the traditional Enterprise Resource Planning (ERP), Point of Sale (POS) and other systems of enterprises have been unable to meet the production requirements of enterprises, and the decision-making information provided for enterprises is also poorer, making it more difficult to transform and integrate data ^[1]. In addition, with the increase of databases, the phenomenon of heterogeneous environment is obvious. And how to do a good job in heterogeneous environment of data conversion is particularly necessary. The business of the enterprise is relatively scattered and the number of databases is increasing. A platform that can integrate various data of the enterprise is needed to unify the analysis of enterprise reports and integrate the business status of the enterprise. Through the analysis of core indicators, the horizontal and vertical comparison of data is realized, so as to provide effective strategies for the operation and development of enterprises.

3. Construction objectives of project data analysis system

In the construction of the project data analysis system, Extract-Transform-Load (ETL), Oracle and other joint applications are used to design a BI analysis management platform, sort out and analyze the business indicators, and achieve the following objectives:

- (1) First, build a network business intelligence platform, integrate and transmit different database data, realize data sharing and solve the problem of isomerization data.
- (2) Second, the system can generate business analysis reports to improve the efficiency of enterprise data analysis.
- (3) Third, the data business of the project should be comprehensively and multi-dimensionally analyzed.
- (4) Fourth, diversified presentation of the statement interface to make the form of the statement more diverse.
- (5) Fifth, expand the functions of the system and connect with other businesses effectively.
- (6) Sixth, streamline the operation of reports, so that the definition, distribution and maintenance of reports have standardized processes.

4. Architecture of BI data analysis system

BI data analysis system includes source data layer, data extraction layer, data staging layer, data warehouse layer and data application layer. Among them, the source data layer mainly analyzes the source data in the enterprise. The data generated by various businesses in the daily operation and management of an enterprise can be used as source data, including purchase data, business transaction data, sales data and financial data. The data extraction layer is the extraction of source data in enterprise business ^[2]. Through the extraction of source data in the data extraction layer and data analysis, it provides a reference for future data research and verification. The data staging layer refers to the operation storage area of data, including data extraction, conversion, storage and other processing contents, so as to provide support for data warehouse source data analysis. The data warehouse layer is a form of operation using the staging layer, which provides query services for users through calculation, processing and data warehouse storage; In the architecture of the application layer, the access business is carried out through the Browser/Server Architecture. It can generate various work and analysis reports, which is conducive to the analysis of enterprise procurement, production, sales and finance, optimize enterprise resource allocation and improve enterprise user management efficiency.

5. Influence factors and solutions of BI data analysis system

5.1. Incomplete capture of Manufacturing Execution System (MES) scanning points

Through the application of BI data analysis system, there are still imperfect problems in the capture of MES scanning points. For example, in the data analysis of product repair qualification rate in the BI data analysis system, the program setting of the system requires that the repaired goods can be captured by the BI system only after they are online, frozen and qualified for repair through scanning of each program. However, if the product is repaired more than twice, there will be differences with the set data logic in the scanning of these three links, and the BI system will miss grasping in the grasping of repaired qualified products, resulting in inaccurate data collection of product repair qualification rate. Therefore, in the design of the system, it is necessary to do a good job in information capture logic revision to integrate heterogeneous data and ensure that similar data in the system can be captured accurately. Through many tests, the captured data of BI data system is compared with manual data to ensure the accuracy of logic formulation.

5.2. The manual data upload of BI system is unreasonable

In BI system, some data can be captured directly by the system, and some data need to be input by manual

data. For example, for customer complaint information entry, the data information entry specialist needs to download the standard template on the BI data platform, and then upload the data to the data collection platform [3]. However, if the data filling format is wrong in the process of uploading, or the data is uploaded before the format is set, it is easy to cause the BI data analysis system platform to be unrecognized. For example, if the date format is set to 20XX / XX / XX, but it is entered as XX / XX / 20XX during the input process, the system will not recognize it. To solve this problem, the uniformity must be ensured in the design of the data acquisition platform template. The input data must be consistent with the requirements of the template, otherwise it cannot be submitted, or the system will automatically give a prompt to ensure the accuracy and effectiveness of manual information input through the setting of error prevention function.

5.3. Time differences existed in data synchronization

In the application of BI data analysis system, the data capture time needs to be set. The usual setting time is 8:00 a.m. to 8:00 a.m. the next day. However, there will be time error in the system. MES or System Applications and Products (SAP) data capture was not carried out at exactly 8:00, resulting in incomplete data. Aimed at this problem, due to the time of error only about 1 minute around 8:00, the error is not big. The enterprise can combine business situation, compare the data capture situation of the system with manual recording data, view the difference between the two, determine how to improve, or do not make system improvement through business adjustment.

5.4. System processing lag

In the data processing of BI data analysis system, Quality Management System (QMS) / MES and other modules are prone to lag, resulting in deviation of BI system indicators. For example, in the calculation of quality loss, the QMS system has given unqualified documents, but did not give reasonable treatment opinions, or in the statistics of unqualified products in the MES system, the products have been frozen without giving accurate judgment results. In the absence of an evaluation, the BI data analysis system cannot accurately capture the data. As a result, the quality loss index is not fully reflected and the index value of the current day is inaccurate. After the processing of unqualified documents is completed on the second day, the product will be judged as scrap, and the quality loss will be regarded as a numerator, but the loss of the day cannot be accurately expressed, affecting the index value. To solve this problem, enterprises can require to make handling opinions within 24 hours in system design and management. If it is not handled in time, the process will jump automatically. Although the indicators of the current day may be affected, as long as the statistical process of nonconforming products can be completed in the current month, the quality loss value within one month will not be affected.

5.5. The handover data is inconsistent

Some enterprises will adopt the two-shift system in the application of BI data analysis system, so that there are great differences between handover data, which can be analyzed from two aspects. The first is that the personnel on duty do not process the QMS system from the completion of the task of the shift to the time of taking over the shift, so that the accumulation of these data will enter the work of the next team, which may lead to inaccurate data processing because the next team does not participate in the work. Or the BI system has time differences in the setting of shift system. For example, the system setting requires that the first shift information capture time is 8:00 a.m. to 8:00 p.m. The information capture time of the second team is from 8:00 p.m. to 8:00 a.m. the next day. However, the actual working time of the team may be advanced or delayed by about 10 minutes, resulting in inaccurate data capture and chaotic data recording of the two teams. In view of these two problems, it can be required that each team must complete their own work before shift handover. The work of this shift cannot be left to the next team. At the same time, no

operation will be carried out 10 minutes before shift handover.

6. Attention issues of BI data analysis system application

6.1. Support from leaders

The application of BI data analysis system is inseparable from the support of leaders, which is strictly implemented from top to bottom. At the same time, enterprise leaders need to authorize the corresponding person in charge to ensure the scientific operation of the system. At the same time, in the system import, leaders need to take the lead to standardize the use of the system, and put forward the corresponding improvement and improvement strategies combined with their own applications.

6.2. Sort out business indicators

Sorting out business indicators in BI data analysis system is the basis of system application. Logical compilation can be completed through sorting out indicators, so as to better guide the docking and development of business systems and ensure the accuracy of data checking. In combining, the logic and operability of the indicators should be analyzed to ensure the rationality of the formulation of the indicators.

7. Conclusion

To sum up, the BI data analysis system provides a good data integration and analysis platform for the enterprise, and provides accurate statistical analysis reports for the work of each business department of the enterprise. Moreover, it can provide comprehensive and scientific decision-making data information for enterprises through the analysis of statements, so that enterprises can optimize enterprise development objectives and business means by adjusting operation strategies.

Disclosure statement

The author declares no conflict of interest.

References

- [1] Li WW. 2017, Application of Enterprise BI data Analysis System. *Computer Knowledge and Technology*, 13(24): 11-12,14.
- [2] Song X, Guo J, Yin SY, et al., 2015, Application of Business Intelligence in Data Analysis of Power Grid Dispatching Control System. *Automation of Electric Power Systems*, 39(12): 93-96, 145.0/AEPS20140811007.
- [3] Yang JY, 2018, Design and Implementation of Educational Intelligence Analysis System based on BI Technology. University of Chinese Academy of Sciences.

Author Guidelines

Before your submission, please check that your manuscript has been prepared in accordance to the step-by-step instructions for submitting a manuscript to our online submission system. We recommend that you keep this page open for your reference as you move through the submission process.

If there are any differences in author guidelines between the print and online version, it is recommended that authors refer to the online version for use.

Manuscript Format

Journal of Electronic Research and Application accepts manuscript that is in MS Word or LaTeX format. All manuscripts must be written in clear, comprehensible English. Both American and British English are acceptable. Usage of non-English words should be kept to a minimum and all must be italicized (except for e.g. and i.e.) If you have concerns about the level of English in your submission, please ensure that it is proofread before submission by a native English speaker or a scientific editing service.

Cover letter

All submissions for *Journal of Electronic Research and Application* should include a cover letter as a separate file. A cover letter should contain a brief explanation of what was previously known, the conceptual advancement with the findings and its significance to broad readership. The cover letter is confidential and will be read only by the editors. It will not be seen by reviewers.

Title

The title should capture the conceptual significance for a broad audience. The title should not be more than 50 words and should be able to give readers an overall view of the paper's significance. Titles should avoid using uncommon jargons, abbreviations and punctuation.

List of Authors

The names of authors must be spelled out rather than set in initials with their affiliations footnoted. Authors should be listed according to the extent of their contribution, with the major contributor listed first. All corresponding authors (maximum 2) should be identified with an asterisk. Affiliations should contain the following core information: department, institution, city, state, postal code, and country. For contact, email address of only one corresponding author is expected within the manuscript. Please note that all authors must see and approve the final version of the manuscript before submitting.

Abstract

Articles must include an abstract containing a maximum of 200 words. The purpose of abstract is to provide sufficient information for a reader to choose either to proceed to the full text of the article. After the abstract, please give 3-8 key words; please avoid using the same words as those already used in the title.

Section Headings

Please number all section headings, subheadings and sub-subheadings. Use boldface to identify major headings (e.g. **1**, **2**, **3**, etc.) and subheadings (e.g. **1.1**, **1.2**, **2.1**, **2.2** etc.) For the sub-subheadings, please distinguish it further using non-boldface numbers in parenthesis (e.g. (1), (2), (3), etc.)

Introduction

Introduction should provide a background that gives a broad readership an overall outlook of the field and the research performed. It tackles a problem and states its importance regarding the significance of the study. Introduction can conclude with a brief statement of the aim of the work and a comment about whether that aim was achieved.

Materials and Methods

This section provides the general experimental design and methodologies used. The aim is to provide enough detail for other investigators to fully replicate your results. It is also required to facilitate better understanding of the results obtained. Protocols and procedures for new methods must be included in detail to reproduce the experiments.

Ethics

Ethics information, including IACUC permit numbers and/or IRB name, if applicable. This information should be included in a subheading labelled "Ethics Statement" in the "Methods" section of your manuscript file, in as much detail as possible.

Results

This section can be divided into subheadings. This section focuses on the results of the experiments performed.

Discussion

This section should provide the significance of the results and identify the impact of the research in a broader context. It should not be redundant or similar to the content of the results section.

Conclusion

Please use the conclusion section for interpretation only, and not to summarize information already presented in the text or abstract.

Conflict of Interest

All authors are required to declare all activities that have the potential to be deemed as a source of competing interest in relation to their submitted manuscript. Examples of such activities could include personal or work-related relationships, events, etc. Authors who have nothing to declare are encouraged to add "No conflict of interest was reported by all authors" in this section.

Funding

Authors should declare all financial and non-financial support that have the potential to be deemed as a source of competing interest in relation to their submitted manuscript in this section. Financial supports are generally in the form of grants, royalties, consulting fees and more. Examples of non-financial support could include the following: externally-supplied equipments/biological sources, writing assistance, administrative support, contributions from non-authors etc.

Appendix

This section is optional and is for all materials (e.g. advanced technical details) that has been excluded from the main text but remain essential to readers in understanding the manuscripts. This section is

not for supplementary figures. Authors are advised to refer to the section on ‘Supplementary figures’ for such submissions.

Text

The text of the manuscript should be in Microsoft Word or Latex. The length of the manuscript cannot be more than 50000 characters (inclusive of spaces) or approximately 7000 words.

Nomenclature for genes and proteins

This journal aims to reach researchers all over the globe. Hence, for both reviewers’ and readers’ ease in comprehension, authors are highly encouraged to use the appropriate gene and protein nomenclature. Authors may prefer to utilize resources such as <http://www.ncbi.nlm.nih.gov/gene>

Figures

Authors should include all figures into the manuscript and submit it as 1 file in the OJS system. Reference to the “Instructions for Typesetting manuscript” is strongly encouraged. Figures include photographs, scanned images, graphs, charts and schematic diagrams. Figures submitted should avoid unnecessary decorative effects (e.g. 3D graphs) as well as be minimally processed (e.g. changes in brightness and contrast applied uniformly for the entire figure). It should also be set against a white background. Please remember to label all figures (e.g. axis etc.) and add in captions (below the figure) as required. These captions should be numbered (e.g. **Figure 1**, **Figure 2**, etc.) in boldface. All figures must have a brief title (also known as caption) that describes the entire figure without citing specific panels, followed by a legend defined as description of each panel. Please identify each panel with uppercase letters in parenthesis (e.g. A, B, C, etc.)

The preferred file formats for any separately submitted figure(s) are TIFF or JPEG. All figures should be legible in print form and of optimal resolution. Optimal resolutions preferred are 300 dots per inch for RGB coloured, 600 dots per inch for greyscale and 1200 dots per inch for line art. Although there are no file size limitation imposed, authors are highly encouraged to compress their figures to an ideal size without unduly affecting legibility and resolution of figures. This will also speed up the process of uploading in the submission system if necessary.

The Editor-in-Chief and Publisher reserve the right to request from author(s) the high-resolution files and unprocessed data and metadata files should the need arise at any point after manuscript submission for reasons such as production, evaluation or other purposes. The file name should allow for ease in identifying the associated manuscript submitted.

Tables, lists and equations

Tables, lists and equations must be submitted together with the manuscript. Likewise, lists and equations should be properly aligned and its meaning clear to readers. Tables created using Microsoft Word table function are preferred. Place each table in your manuscript file right after the paragraph in which it is first cited. Do not submit your tables in separate files. The tables should include a concise but sufficiently explanatory title at the top. Vertical lines should not be used to separate columns. Leave some extra space between the columns instead. All tables should be based on three horizontal lines to separate the caption, header and body. A few additional horizontal lines MAY be included as needed (example below). Any explanations essential to the understanding of the table should be given in footnotes at the bottom of the table. SI units should be used.

Supplementary information

This section is optional and contains all materials and figures that have been excluded from the entire manuscript. This information are relevant to the manuscript but remains non-essential to readers' understanding of the manuscript's main content. All supplementary information should be submitted as a separate file in Step 4 during submission. Please ensure the names of such files contain 'suppl. info'.

In-text citations

Reference citations in the text should be numbered consecutively in superscript square brackets. Some examples:

1. Negotiation research spans many disciplines ^[3, 4].
2. This result was later contradicted by Becker and Seligman ^[5].
3. This effect has been widely studied ^[1–3, 7].

Personal communications and unpublished works can only be used in the main text of the submission and are not to be placed in the Reference section. Authors are advised to limit such usage to the minimum. They should also be easily identifiable by stating the authors and year of such unpublished works or personal communications and the word 'Unpublished' in parenthesis.

E.g. (Smith J, 2000, Unpublished)

References

This section is compulsory and should be placed at the end of all manuscripts. Do not use footnotes or endnotes as a substitute for a reference list. The list of references should only include works that are cited in the text and that have been published or accepted for publication. Personal communications and unpublished works should be excluded from this section.

For references in reference list, all authors must be stated. Authors referenced are listed with their surname followed by their initials. All references should be numbered (e.g. 1. 2. 3. etc.) and sequenced according to the order it appears as an in-text citation. References should follow the following pattern: Author(s) followed by year of publication, title of publication, full journal name in italics, volume number, issue number in parenthesis, page range and lastly the DOI (if applicable). If the referred article has more than three authors, list only the first three authors and abbreviate the remaining authors to italicized 'et al.' (meaning: "and others").

Journal

Journal article (print) with one to three authors

[1] Yao Y., Xia B. Application of Phase Frequency Feature Group Delay Algorithm in Database Differential Access. Computer Simulation, 2014, 31(12): 238-241.

Journal article (print) with more than three authors

[2] Gamelin F.X., Baquet G., Berthoin S., et al. Effect of high intensity intermittent training on heart rate variability in prepubescent children. European Journal of Applied Physiology, 2009, 105: 731–738.

Journal article (online) with one to three authors

[3] Jackson D., Firtko A., Edenborough M. Personal resilience as a strategy for surviving and thriving in the face of workplace adversity: a literature review. *Journal of Advanced Nursing*, 2009, 60(1): 1–9,

Journal article (online) with more than three authors

[4] Hargreave M., Jensen A., Nielsen T.S.S., et al. Maternal use of fertility drugs and risk of cancer in children—A nationwide population-based cohort study in Denmark. *International Journal of Cancer*, 2015, 136(8): 1931–1939.

Book

Book with one to three authors

[5] Schneider Z., Whitehead D., Elliott D. *Nursing and midwifery research: methods and appraisal for evidence-based practice*. 3rd edn. 2009, Elsevier Australia, Marrickville, NSW.

Book with more than three authors

[6] Davis M., Charles L., Curry M.J., et al. *Challenging spatial norms*. 2013, Routledge, London.

Chapter or Article in Book

[7] Knowles M.S. Independent study. In *Using learning contracts*. 1986, Jossey-Bass, San Francisco, 89–96.

Others

Proceedings of meetings and symposiums, conference papers

[8] Chang S.S., Liaw L. and Ruppenhofer J. (eds). *Proceedings of the twenty-fifth annual meeting of the Berkeley Linguistics Society, February 12–15, 1999: general session and parasession on loan word phenomena*. 2000, Berkeley Linguistics Society, Berkeley.

Conference proceedings (from electronic database)

[9] Bukowski R.M. Prognostic factors for survival in metastatic renal cell carcinoma: update 2008. *Innovations and challenges in renal cancer: proceedings of the third Cambridge conference*. *Cancer*, 2009, 115 (10): 2273, viewed 19 May 2009, Academic OneFile database.

Online Document with author names

[10] Este J., Warren C., Connor L., et al. *Life in the clickstream: the future of journalism*, Media Entertainment and Arts Alliance, 2008. viewed 27 May 2009, http://www.alliance.org.au/documents/foj_report_final.pdf

Online Document without author name

[11] *Developing an argument* n.d., viewed March 30 2009, http://web.princeton.edu/sites/writing/Writing_Center/WCWritingResources.htm

Thesis/Dissertation

[12] Gale L. *The relationship between leadership and employee empowerment for successful total quality management*. 2000, University of Western Sydney.

Standard

[13] Standards Australia Online. Glass in buildings: selection and installation. AS 1288–2006. 2006, SAI Global database.

Government Report

[14] National Commission of Audit. Report to the Commonwealth Government, Australian Government Publishing Service, 1996, Canberra.

Government report (online)

[15] Department of Health and Ageing. Ageing and aged care in Australia, 2008, viewed 10 November 2008, <http://www.health.gov.au/internet/main/publishing.nsf/Content/ageing>

No author

[16] Guide to agricultural meteorological practices. 2nd edn, Secretariat of the World Meteorological Organization, 2010, Geneva.

Note: When referencing an entry from a dictionary or an encyclopedia with no author there is no requirement to include the source in the reference list. In these cases, only cite the title and year of the source in-text. For an authored dictionary/encyclopedia, treat the source as an authored book.

Submission Preparation Checklist

As part of the submission process, authors are required to check off their submission's compliance with all of the following items, and submissions may be returned to authors that do not adhere to these guidelines.

1. The submission has not been previously published, nor is it before another journal for consideration (or an explanation has been provided in Comments to the Editor).
2. The submission file is in OpenOffice, Microsoft Word, RTF, or WordPerfect document file format.
3. Where available, URLs for the references have been provided.
4. The text is single-spaced; uses a 12-point font; employs italics, rather than underlining (except with URL addresses); and all illustrations, figures, and tables are placed within the text at the appropriate points, rather than at the end.
5. The text adheres to the stylistic and bibliographic requirements outlined in the Author Guidelines, which is found in About the Journal.
6. If submitting to a peer-reviewed section of the journal, the instructions in Ensuring a Blind Review have been followed.



Integrated Services Platform of International Scientific Cooperation

Innoscience Research (Malaysia), which is global market oriented, was founded in 2016. Innoscience Research focuses on services based on scientific research. By cooperating with universities and scientific institutes all over the world, it performs medical researches to benefit human beings and promotes the interdisciplinary and international exchanges among researchers.

Innoscience Research covers biology, chemistry, physics and many other disciplines. It mainly focuses on the improvement of human health. It aims to promote the cooperation, exploration and exchange among researchers from different countries. By establishing platforms, Innoscience integrates the demands from different fields to realize the combination of clinical research and basic research and to accelerate and deepen the international scientific cooperation.

Cooperation Mode



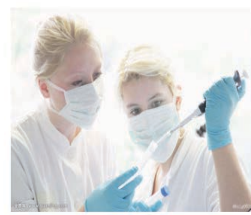
Clinical Workers



In-service Doctors



Foreign Researchers



Hospital



University



Scientific institutions

OUR JOURNALS



The *Journal of Architectural Research and Development* is an international peer-reviewed and open access journal which is devoted to establish a bridge between theory and practice in the fields of architectural and design research, urban planning and built environment research.

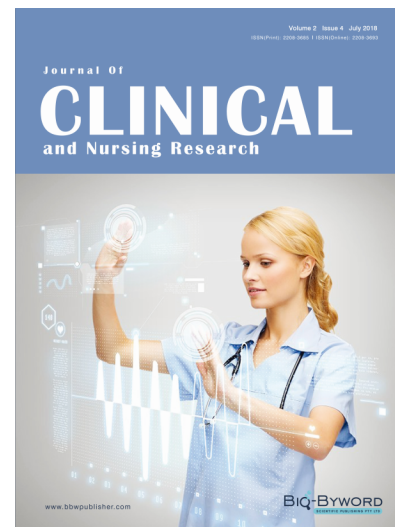
Topics covered but not limited to:

- Architectural design
- Architectural technology, including new technologies and energy saving technologies
- Architectural practice
- Urban planning
- Impacts of architecture on environment

Journal of Clinical and Nursing Research (JCNR) is an international, peer reviewed and open access journal that seeks to promote the development and exchange of knowledge which is directly relevant to all clinical and nursing research and practice. Articles which explore the meaning, prevention, treatment, outcome and impact of a high standard clinical and nursing practice and discipline are encouraged to be submitted as original article, review, case report, short communication and letters.

Topics covered by not limited to:

- Development of clinical and nursing research, evaluation, evidence-based practice and scientific enquiry
- Patients and family experiences of health care
- Clinical and nursing research to enhance patient safety and reduce harm to patients
- Ethics
- Clinical and Nursing history
- Medicine



Journal of Electronic Research and Application is an international, peer-reviewed and open access journal which publishes original articles, reviews, short communications, case studies and letters in the field of electronic research and application.

Topics covered but not limited to:

- Automation
- Circuit Analysis and Application
- Electric and Electronic Measurement Systems
- Electrical Engineering
- Electronic Materials
- Electronics and Communications Engineering
- Power Systems and Power Electronics
- Signal Processing
- Telecommunications Engineering
- Wireless and Mobile Communication

