

# Analysis of the Exploration of University Financial Reimbursement Models in the Digital Age - Taking Zhejiang Yuexiu University as an Example

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**Abstract:** In recent years, electronic invoices have entered a phase of rapid growth, and the state has introduced a series of policies to strengthen the management of electronic invoices. Universities, as a special group, have a large number of staff members, and produce a large number of reimbursement vouchers each month, leading to a linear increase in the number of electronic invoices. This results in a doubling of the workload for financial auditors and accountants, making university financial digital transformation urgent. This article takes Zhejiang Yuexiu University as an example to dissect the issues existing in the traditional offline reimbursement model and analyze the significant changes brought by the new smart reimbursement system based on practical experience. The analysis concludes that the new reimbursement model is a concrete manifestation of university digital transformation. The new model breaks through the information silos of financial data, laying a data foundation for the implementation of bank-university interconnection and electronic archives.

**Keywords:** Universities, Digital transformation, New reimbursement.

## 1. Introduction

According to survey statistics, China's investment in higher education has been increasing over the past decade. By 2019, the investment in higher education had reached 13464 billion yuan, an increase of 2.08 times compared to ten years ago. Higher education has attracted sufficient attention from the state. With continuous funding increases, the number of reimbursements in universities has been increasing year by year. Coupled with complex types of reimbursements in universities (as shown in Figure 1), which include school-level, second-level, project, income-generating, etc. different reimbursement types have different approval processes, exacerbating the difficulty of financial audit work and lengthening the time for reimbursements. The efficiency of financial audit work has always been controversial among

faculty members, and the issue of reimbursement conflicts is becoming increasingly serious. Universities pay high attention to the reimbursement experience of faculty members, aiming to improve the difficult situation of "reimbursement difficulties" through information technology. In 2021, Zhejiang Yuexiu University launched the "Smart Reimbursement System," using big data technology to enhance financial work efficiency and promote the process of digital transformation in the university, improving satisfaction among teachers and students. This article takes Zhejiang Yuexiu University as an example to dissect the problems existing in the traditional offline reimbursement model and analyze the convenience brought by the new reimbursement system for auditing and accounting for university faculty members. At the same time, it elaborates on the construction of the university's financial information system.

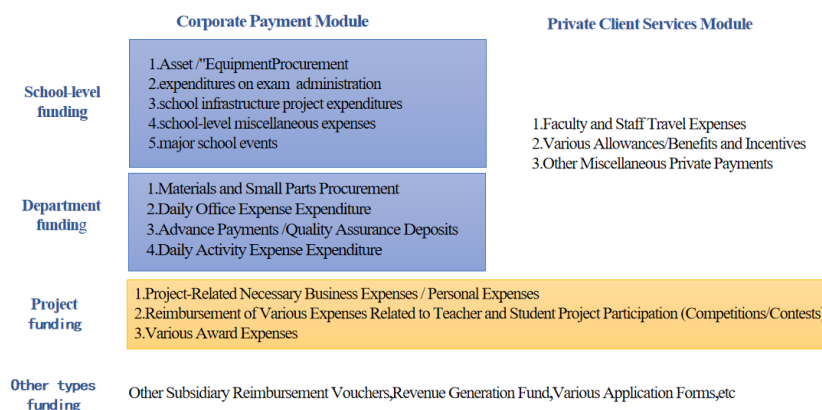


Figure 1. Financial resources types

## 2. Issues with Traditional Offline Reimbursement Model

In the traditional offline reimbursement model, financial systems such as the expense management system, budget

management system, and payment system operate independently, as shown in Figure 2. These systems are unable to share information with one another. Against this backdrop, the traditional offline reimbursement model faces numerous issues.

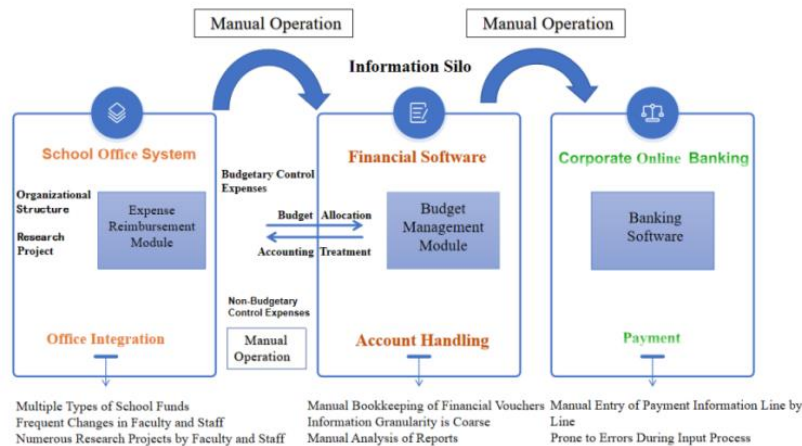


Figure 2. Financial System Relationship Map

### 2.1. The pre-control failed

Some faculty members consider this process too cumbersome because department leaders have already signed off on the reimbursement voucher; they believe there is no need to submit additional application attachments again. Therefore, pre-control becomes merely formalistic without achieving real control effects.

### 2.2. Duplication of Invoice Reimbursements

Currently, with electronic invoices being widely used, traditional offline reimbursement requires faculty members to print out invoices for reimbursement. Printing does not have limitations on the number of copies, making it extremely difficult for them to remember whether an invoice has been reimbursed before. This situation can lead to duplication of invoice reimbursements. Moreover, to speed up offline financial audit work efficiency, finance departments require faculty members to print tax website verification results as proof of invoice authenticity when submitting their claims. This causes some faculty members who are unfamiliar with related website operation methods to become frustrated, exacerbating conflicts between faculty members and financial auditors.

### 2.3. Increased Difficulty in Financial Auditing

With an increase in reimbursement vouchers comes increased workload and difficulty for financial auditors to verify the legality and authenticity of invoices by eyeball recognition alone. Each invoice needs to be checked for header information, amount, detailed list of invoice creation, and inspection certificates, consuming a lot of time and energy. Especially at the end or beginning of each semester when there is a sharp increase in reimbursement numbers, the average waiting time for faculty members can be extended, leading to increased dissatisfaction.

### 2.4. Longer Approval Processes

Some universities operate across multiple campuses, and reimbursement approval requires signatures from relevant leaders and school administrators. Faculty members need to travel between campuses to sign approvals, and some departmental auditors have "dual responsibilities," often

traveling or attending meetings, making their office times unpredictable. Under these circumstances, faculty members usually accumulate their reimbursement vouchers for collective signing, which is a heavy workload that overwhelms the ability to approve.

### 2.5. Pressure on Balance-Sheet Preparation Time

Financial accountants are expected to complete all voucher accounting by the beginning of the next month. At the start and end of each semester, there is an urgent increase in the number of vouchers, leading to tight preparation time and higher error rates, low reconciliation efficiency, and increased workload for financial personnel who need to deal with both reimbursements and balance sheet preparation.

### 2.6. Time-Consuming Invoice Checking and Verification

Firstly, due to frequent purchases from designated units, many invoices from these units have consistent amounts, causing uncertainty about which department paid. Therefore, they will conduct checks on invoices. The original offline reimbursement method is complex, requiring verification of invoice creation and accounting times, finding certificate numbers, searching for documents, verifying reimbursement personnel, and then providing feedback. The process is cumbersome and complex, with extremely low efficiency. Secondly, faculty members may have personal research projects, and the analysis of budget costs cannot be effectively evaluated. Budget managers cannot view real-time budget limits and detailed information; expense report analysis requires manual query followed by statistical analysis, with large data granularity. When closing down projects, it takes a lot of time to reconcile with relevant management departments and finance staff because projects take a long time, and year-by-year reconciliation of each entry consumes a large amount of time, resulting in low reconciliation efficiency.

### 2.7. Deficiencies in Paper Document Reimbursement

Firstly, most universities still use traditional paper invoices

as the original reimbursement document. With the widespread use of electronic invoices, the original voucher has become a copy. A single invoice goes through multiple stages of reimbursement, and information on the invoice becomes distorted over time, losing its purpose of being kept as a record. Secondly, due to different types of reimbursement invoices that vary in size, it is difficult to bind them together when pasting them onto the reimbursement slip. This leads to events where invoices fall out of the reimbursement slip and must be checked against the reimbursement slip one by one, wasting a lot of manpower and material resources. Thirdly, traditional paper signing leaves room for imitating handwriting, making it impossible to track traces and preventing strict risk control within finance management. There are loopholes in financial management.

### 2.8. Mechanization of Payment Procedures

Currently, the university's cashier phase involves manual input, with many staff members leading to errors in payment amounts frequently occurring. Additionally, some banks do not support batch import functions and only allow individual entries, consuming manpower and materials. For universities

working with their unique nature that has many bank accounts, each account needs daily reconciliation, making daily maintenance management more cumbersome.

### 3. Solutions under Digital Era University "Smart Reimbursement Finance System"

In recent years, Zhejiang Yuexiu University has been advancing information construction and building digital campuses. In this context, the school aims to improve the "reimbursement difficulty" situation through information technology to enhance satisfaction among faculty members. Therefore, in 2021, the school launched the Smart Reimbursement Finance System. The system uses optical character recognition technology automatically to identify invoice authenticity, greatly improving the reimbursement experience for university faculty members; to a certain extent, it breaks through information silos (as shown in Figure 3), reimbursement, accounting, and budget management, further promoting the construction of a smart campus in schools.

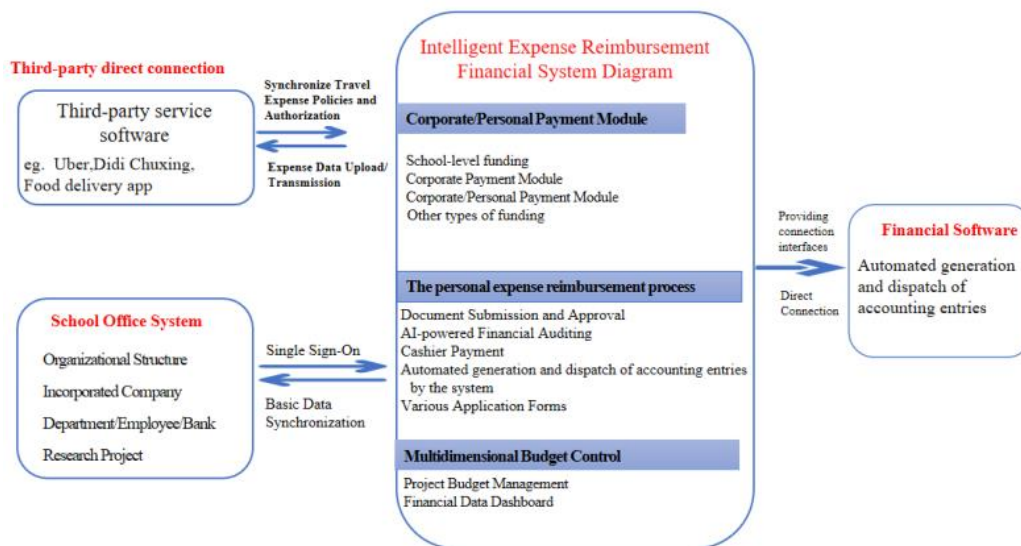


Figure 3. Intelligent Expense Reimbursement Financial System Diagram

The overall reimbursement process of the Smart Reimbursement Finance System is set according to school documents (as shown in Figure 4). The following aspects

have improved the difficulties of traditional university reimbursements:

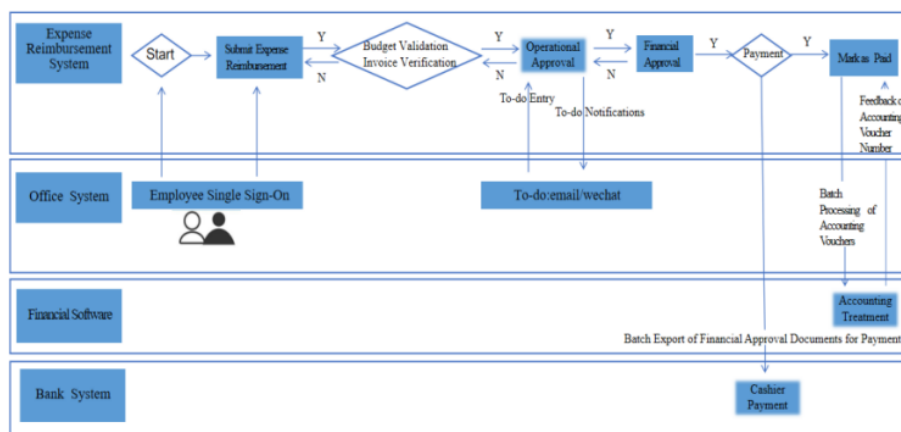


Figure 4. Reimbursement Process Flowchart

### **3.1. Direct Online Voucher Submission for Reimbursement**

Firstly, after the launch of the system, faculty members and students can submit their vouchers online through mobile phones or computers with a single log-in point. The system supports group photo reading and intelligent invoice recognition; multiple types of invoices can be uploaded simultaneously and also support third-party software invoice import via WeChat and Alipay. Secondly, since the system is connected with the tax website, uploaded invoices can be verified instantly without login to the tax website for verification printing inspection certificates; at the same time, the system automatically calculates invoice amounts without manual addition. Moreover, the system supports electronic invoice duplication checking; a single electronic invoice can only be submitted once for reimbursement to eliminate duplication issues and save a lot of recall time for those submitting claims; thirdly, claim submitters can check the reimbursement process in the system and control progress; if urgent approval is needed for a voucher, it can be clicked to urge processing; if there are errors in submitted vouchers, they can be recalled and modified before being submitted again; thus improving satisfaction among faculty members significantly.

### **3.2. Reduced Workload for Financial Auditing**

Firstly, the system verifies according to school rules configured by configuration; the system automatically indicates Tax Identification Number (TIN) and authenticity of invoices on it without needing manual verification by financial auditors; secondly, the system automatically calculates invoice amounts so that auditors do not need to add up each invoice manually anymore; furthermore, duplicate submission of vouchers is not allowed from the ground level for controlling duplication issues; thirdly, some auditors tend to accumulate a certain amount of invoices for collective submission in traditional offline methods that require sorting numbers for individual verification in offline systems; however, upon launch of the system automatically identifying consecutive invoice numbers for reminder; therefore reducing financial audit workload significantly through reminders and verification; hence shortening review time noticeably; thus enhancing review efficiency evidently.

### **3.3. Shortened Approval Time**

By logging into the system via mobile phone or computer for auditing instead of original offline signature method; firstly related approvers can approve online either manually writing or clicking through; secondly approvers can authorize approval based on type of approved documents or payment amount size; thus relieving approval burden for those who are across multiple campuses; hence reducing complexity in reimbursing teachers by not needing to run around campuses anymore; thirdly approving online helps prevent fraudulent signature attempts because traditional offline signature leaves room for imitation signature person's handwriting; fourthly approving online has traceability regarding work ID password uniqueness; IP address timing during approval can be traced; therefore risk control within finance can be managed; fifthly approving online reduces waiting time for approval overall; teachers do not need accumulating voucher batches for signature anymore; hence more prompt reimbursements achieved.

### **3.4. Guaranteed Balance-Sheet Preparation Time**

There are multiple financial accountants in universities with various bank accounts not unique; traditional offline preparation time is pressing due to high volume at start and end of each semester leading to tight schedule pressure; however upon launch of system connecting with financial software system; upon payment by cashier staff member pushing voucher after pushing voucher into financial system preparer adjusting directly within financial system; hence no interference with each other ensuring full completion within scheduled time frame; hence balancing preparation workload managed well within timeline available.

### **3.5. Data Source for Invoice Checking and Verification**

Firstly frequent purchases from designated units cause many identical amounts leading uncertainty about which department paid; therefore they conduct checks on invoices previously offline complicated process requires looking up opening date of invoice creation and accounting times finding certificate number going back to find documents verifying personnel providing feedback afterwards complex cumbersome process extremely low efficiency; however upon launch of system directly entering amount or dealing unit into Invoice Inquiry Module immediately accessible on system identifying claimant name claim number purchased products info etc verifying very easily compared to traditional offline approach; secondly similar approach assistance government Audit and Tax Authority Joint Investigation fast accurate online checking significant improvement efficiency greatly enhanced by online checking approach.

### **3.6. Graded Budget Use Situation Inquiry**

There are various types of reimbursements in universities including college daily funds school construction funds project funds student projects etc traditional budget inquiry always depends on inquiry from finance department about fund usage situation however upon launch of system each fund manager can separately check fund usage situation along with reimbursement details grasping fund usage progress hence needing closure project teacher can log into account check project funded situation filling closure report from system exporting custom template filling closure report changing originally passive waiting data status hence customizable table template designed by finance analysis requirements multi-dimensional statistical analysis carried out for various funds real-time control analysis provided by school finance team.

### **3.7. Project Management Process Control**

Generally speaking teacher's project funding allocation needs following steps ① school announcement→② Submit Budget Report to Management Department→③ management department collect fully submit to finance department→④ finance department allocation→⑤ change budget requires repeat step ② and ③ processes traditional offline reimbursement ② and ⑤ step require paper materials submission across campuses involving multi-campus teacher running around more troublesome especially funding allocation whether allocated needs asking by phone however upon launch of system following original process allocating funding but all steps online flowing completely henceforth

send notification after allocating notice teacher actively grasp project from allocation using ending conclusion all situations henceforth no need running across campuses submit materials any more.

After the outbreak of COVID-19 in 2020, working from home made it impossible to carry out reimbursement work. Against this backdrop, universities sought new reimbursement models. The launch of online reimbursement systems brought about a significant change for university staff, making the reimbursement process smoother and earning unanimous praise from them. Moreover, Zhejiang Yuexiu University, considering the nature of the staff's work, placed invoice drop boxes at fixed locations for staff in both campuses, with designated personnel collecting and auditing invoices weekly.

#### 4. "Smart Reimbursement Systems" Accelerate the Process of Digitalization in University Finance

In recent years, the state has introduced numerous policies to advance the process of accounting digitalization, placing significant emphasis on the datafication of electronic accounting vouchers. As a unique entity, universities generate a substantial volume of electronic invoices each month and manually process a large number of reimbursement documents, while the storage of accounting archives consumes considerable resources, wasting both human labor

and material assets, as well as time and space. To implement the national accounting reform requirements, following the launch of our online intelligent reimbursement system, our university adheres to the principles of green, sustainable development, aspiring to leverage the interbank-university connectivity system and electronic archival system to conserve energy and resources, thereby reducing operational costs for university finances.

##### 4.1. The interbank-university connectivity system

In Figure 5, it is a mature payment and settlement system that achieves seamless integration between the reimbursement system and the bank's payment system. Upon completion of the reimbursement process in the system, payments are automatically pushed for review by the cashier, replacing the manual input of each transaction in the bank's system previously required. This eliminates the need to retrieve electronic transaction receipts from the bank. The system further optimizes workflow, alleviating the workload of financial staff and enhancing the accuracy of payment processes. Simultaneously, it implements dual control over incoming and outgoing funds; given the multitude of school accounts, the system centralizes account management within a single platform, mitigating financial risks. This interbank-university connectivity system lays the data groundwork for the implementation of an electronic archival system.

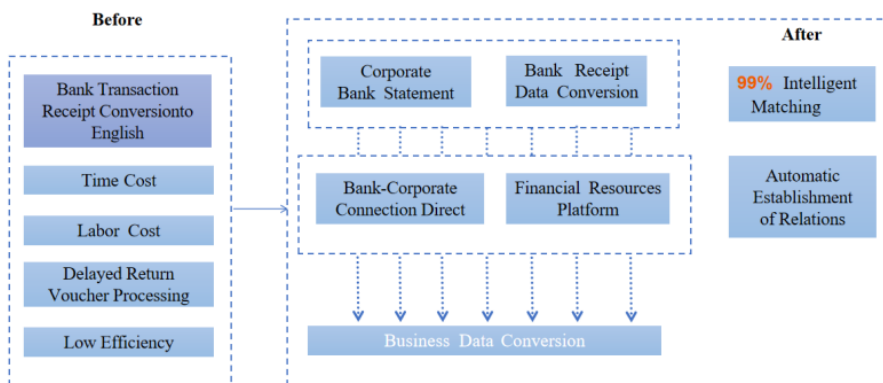
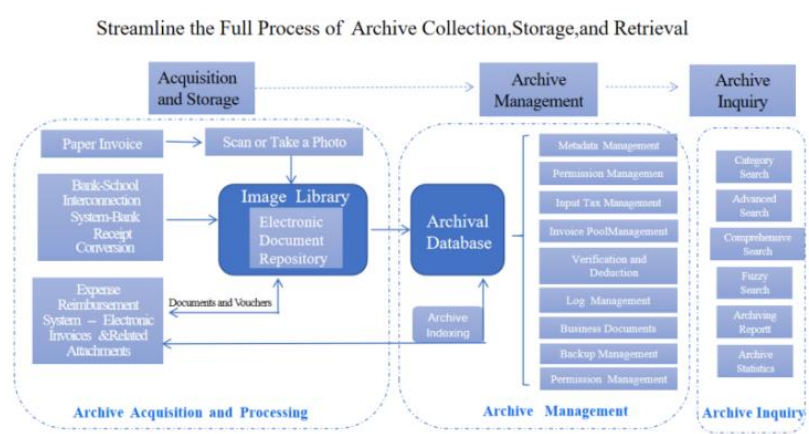


Figure 5. The interbank-university connectivity system

##### 4.2. Electronic Archive Systems

Traditional paper-based archives have extremely low resilience against risks, with the potential for irreversible consequences in the event of human errors or natural disasters. Moreover, the binding and preservation of paper archives consume a vast amount of time and space. Accounting archives constitute an indispensable part of daily operations in higher education institutions, necessitating not only the fulfillment of internal bookkeeping and major decision-making needs but also adherence to national regulations regarding voucher storage. Furthermore, they must provide data support for various specialized inspections and auditing

tasks. Driven by big data technology, the state vigorously supports the adoption of electronic archives, with the implementation of electronic archive systems accelerating the digitalization of university finances, as illustrated in Figure 6. These systems interface with reimbursement and bank payment systems, storing invoices, related attachments from reimbursement documents, and bank return slips as electronic vouchers, thereby breaking down information silos of fundamental financial data. The system also enables access restrictions based on user permissions, significantly enhancing the efficiency of audit and accounting inspection personnel.



**Figure 6.** Electronic Archive Systems

## 5. Conclusion

In conclusion, the state's investment in research funding for universities has seen a steady annual increase, paralleled by a rise in reimbursement volumes and a proliferation of electronic invoices, necessitating a transition within higher education institutions. Given their status as hubs of talent, universities should actively embrace digital transformation. Zhejiang Yuexiu University has boldly ventured into exploring innovative reimbursement models, launching a smart reimbursement system and enthusiastically endorsing the implementation of electronic archival systems, thereby propelling the development of a digital campus. Institutions should leverage big data capabilities to dismantle information silos in financial data, fostering a convergence of operational, accounting, and banking data. This integration should be harnessed to cultivate multipurpose financial management teams, driving a transformation in university administration and enabling high-quality development in the realm of higher education.

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## References

- [1] Chen, Jingshu. Research on the Construction of Smart Financial Management System in H University [D]. Central South University of Forestry and Technology, 2021.
- [2] Zhang, Pei. Problems and Countermeasures of Paperless Reimbursement in the Era of Informatization. *China Management Informationization*, 2020(22).
- [3] Sun, Baoning, and Guo, Fei. Research on Transformation Strategies of University Finance in the Era of Big Data, Intelligent Technology, Mobile Internet, and Cloud Computing [J]. *Friend of Accounting*, 2021(23): 134-140.
- [4] Luo, Wu. Digital Platforms Empowering the Transformation of University Financial Management. *International Business Accounting*, 2022(09).
- [5] Cui, Yinna. Issues and Challenges Faced under the Transformation Model of University Financial Management. *Accounting for Township and Village Enterprises in China*, 2021(12).
- [6] Chen, Yongjun. Study on the Financial Informatization Construction of Xi'an University of Technology [J]. *China Management Informationization*, 2021(22).
- [7] Liu, Rui. Exploration on the Construction of "Smart Finance" Management Model under the Perspective of Artificial Intelligence [J]. *China Management Informationization*, 2021(20).
- [8] Wang, Shoujun. Observing Changes in China's Scientific Research Funding Management Policies from the "Delegation, Management, and Service" Reform. *Science and Technology of Chinese Universities*, 2019(05).
- [9] Yin, Xuedong, Liang, Yong, Yang, Rui, et al. Practice and Exploration of Online Reimbursement System in University Finance. *Friend of Accounting*, 2019(17).
- [10] Su, Jian. Research on Electronic Accounting Archive Management in the Digital Age: A Case Study of ZJ Group. *International Business Accounting*, 2020(07).