Scalable Computing: Practice and Experience, ISSN 1895-1767, http://www.scpe.org
© 2024 SCPE. Volume 25, Issues 1, pp. 103–114, DOI 10.12694/scpe.v25i1.2277

RESEARCH ON INTELLIGENT TRANSFORMATION PLATFORM OF SCIENTIFIC AND TECHNOLOGICAL ACHIEVEMENTS BASED ON TOPIC MODEL ALGORITHM AND ITS APPLICATION

JING WANG*, KAI WANG†, AND YANFEI CHANG‡

Abstract. Being an integral component of the national scientific and technological innovation structure, the conversion of scientific and technological breakthroughs shifts these discoveries from mere theoretical concepts to practical applications. However, this transformation process encounters issues concerning suboptimal efficiency and standards. This research investigates into the LDA theme model to extract pivotal terms and thematic phrases representing scientific and technological advancements. The aim is to ensure precise representation and endorsement, consequently enhancing the efficiency and quality of the conversion process for academic institutions and businesses. Subsequently, this paper establishes a platform for converting scientific and technological breakthroughs while examining the subsystems of information management, retrieval, and recommendations about these breakthroughs. This platform also includes aspects such as transactions and the delivery of achievements. Additionally, an analysis is conducted on the application effects of the scientific and technological achievement (STA) transformation platform, considering the transformation results and the operational evaluation of these scientific and technological innovations.

Key words: STA, LDA Theme Model, Transformation Platform, Information Management, Operational Evaluation

1. Introduction and examples. The capacity for STA innovation represents a essential measure in evaluating a nation's comprehensive strength. The transformation of STA is fundamental in navigating the complex trajectory from theoretical scientific innovations to physical applications in practical production and everyday use. It stands as the bedrock, propelling the engine of progress and paving the way for fostering a society marked by high standards and quality development. This critical process has, over time, become a subject of unwavering attention and inquiry both within national boundaries and across international frontiers, indicating the universal significance attached to the efficient transformation of knowledge into tangible outcomes [8].

The global competition strengthens, nations increasingly recognize the authoritative of development of a robust STA ecosystem, underlining the significance of advancing research and development endeavours, fostering innovation, and seamlessly integrating these advancements into practical applications. The relentless pursuit of efficient conversion mechanisms has sparked a series of comprehensive studies aiming to streamline the transformation of scientific breakthroughs into practical, real-world applications [7].

The studies conducted within the limits of academic institutions or through collaborative international efforts, underscore the critical need to bridge the gap between theoretical knowledge and tangible applications, thus highlighting the pivotal role played by the transformation of STA in encouraging a nation's overall progress and development. By systematically exploring and analyzing the details of this conversion process, researchers aim to undo the original challenges and impairments, the way for formulating comprehensive strategies and robust frameworks designed to strengthen the efficiency and impact of these transformative endeavours. As a result, these groundbreaking advancements' full potential and impact within the academic sphere often remain under-realized, posing a significant setback in the broader quest for seamless knowledge translation and practical application [9].

Recognizing the significance of bridging the gap, it it is necessary to design and implement a robust, agile, and contemporary transformation platform that is equipped to handle the dynamic nature of STA and capable of providing a comprehensive and systematic evaluation framework. This integrated approach would ensure

*Shandong Institute of Innovation and Development, Jinan, Shandong, China (jingwang516@163.com)
†Heze Public Resources Trading Center, He ze, Shandong, China (Corresponding author: kaiwang7@126.com)
‡Jinan Guida Real Estate Co., Ltd., Jinan, Shandong, 250000, China (yanfeichang@126.com)

that the transformative potential of these achievements is fully harnessed, effectively contributing to the broader landscape of STA and, subsequently, catalyzing overall societal progress and development [12].

A pioneering STA management system takes centre stage, built upon the foundation of a cutting-edge cloud table PAAS code-free development platform. Furthermore, implementing this advanced management system not only streamlines the process of organizing and tracking diverse scientific achievements but also empowers researchers and innovators to navigate the complexities of the research and development landscape more effectively. By providing a robust framework for the effective documentation, assessment, and dissemination of STA breakthroughs, this system catalyzes nurturing a culture of innovation and fostering an environment conducive to the accelerated pace of scientific progress [6].

The findings of shed light on the complexities inherent in the agricultural domain, underlining the critical importance of implementing well-informed and strategic transformational frameworks that are not only rooted in technical feasibility but also align with the practical demands and challenges of the agricultural sector. Against these insights, the current landscape of scientific and technological transformations between academic institutions and enterprises reveals a notable predicament characterized by a lack of efficiency and quality. To address this pressing concern, the research initiative culminates developing a sophisticated platform dedicated to the seamless transformation of STA breakthroughs. Leveraging the advanced capabilities of the LDA topic model algorithm, this platform represents a pioneering effort to streamline and optimize the conversion process. Through a meticulous analysis of the platform's transformative efficiency and a comprehensive evaluation of its overall operational performance, the study paves the way for formulating strategic interventions to enhance the efficacy and impact of STA transformations within the academic and industrial fields [2, 4, 13].

2. LDA Topic Model Algorithm. The Latent Dirichlet Allocation (LDA) topic model, also known as LDA, enables the representation of an article's topics as a probability distribution. It facilitates text analysis and topic clustering based on these distributions. The application of the LDA topic model lies in capturing implicit themes within STA accomplishments. Initially, it dissects the content of such achievements into individual words. Subsequently, it determines the number of topics embedded in these achievements and the proportion of each topic. It is achieved through the extraction and induction of topics and the computation of topic intensity. Ultimately, it employs this information to perform tasks such as classification, clustering, recommendation, retrieval, and other pertinent operations related to STA advancements [10].

The LDA topic model is an unsupervised machine-learning technique rooted in the bag-of-words model. It treats every document describing a scientific or technological advancement as a word vector, wherein the occurrence of each word in these achievements is quantified as a mathematical statistical representation. This approach simplifies the description of STA accomplishments into easily quantifiable data. The LDA topic model operates under the assumption that there exist STA intertwined with K topics. Moreover, it posits that all topics adhere to various distributions following the principles of the Dirichlet distribution [1]. The LDA topic model is shown in Figure 2.1 where α and β respectively represent the Dirichlet prior parameters of the multinomial distribution of each STA topic. θ_m represents the topic distribution of the m^{th} STA, ϕ_k represents the word distribution under the k^{th} topic, $Z_{m,n}$ represents the topic of the n^{th} word in m^{th} STA, and $W_{m,n}$ represents the n^{th} word in m^{th} STA.

Directly using STA as input for the LDA topic model is not feasible. It is imperative to preprocess these achievements by conducting tasks such as word segmentation, aiding in identifying and eliminating redundant words and stop words. The word segmentation procedure recognizes multiple words within these achievements and consolidates them into phrases that effectively convey sentence meaning. Following this operation, only the most frequent top 10 words are preserved, while the rest are discarded. Figure 2.2 illustrates the LDA topic model's process to underly semantics of documents pertaining to STA advancements [11].

Among them, the STA document d and the word w are the samples in the STA set M, and the word segmentation set N, and z is the unknown STA topic. Since d and w are observable variables, random STA $P(w_j \mid d_i)$ can be considered to be known, according to a large number of STA document-word segmentation information $P(w_j \mid d_i)$, we can train the STA documenttopic $P(z_k \mid d_i)$, and topic-word segmentation $P(w_j \mid d_k)$, which satisfies Equation (2.1):

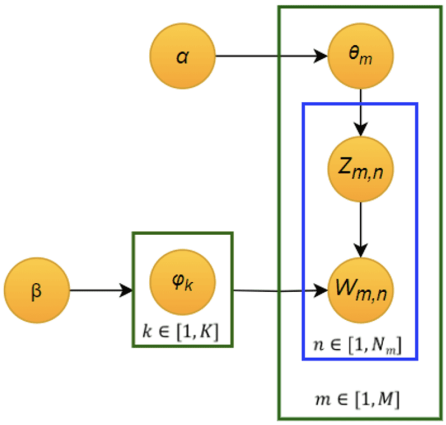

Fig. 2.1: Structure of Latent Dirichlet Allocation (LDA) topic model.

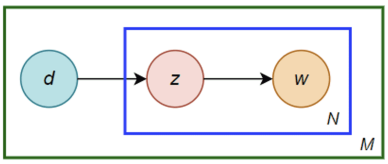

Fig. 2.2: Latent semantic analysis of STA based on LDA model.

$$P(w_j \mid d_i) = \sum_{k=1}^{K} P(w_j \mid z_k) P(z_k \mid d_i) \tag{2.1}$$

The generation probability of each word in the STA document can be expressed as

$$\begin{aligned} P(d_i, w_j) &= \sum_{k=1}^{K} P(d_j) P(w_j \mid d_i) \\ &= P(d_i) \sum_{k=1}^{K} P(w_j \mid z_k) P(z_k \mid d_i) \end{aligned} \tag{2.2}$$

It can calculate $P(d_i)$ from all the STA, but can't calculate $P(w_j \mid z_k)$ and, $P(z_k \mid d_i)$ so the topic classification of STA can be realized by the expected parameter θ

$$\theta = \sum_{k=1}^{K} P(w_j \mid z_k) P(z_k \mid d_i) \tag{2.3}$$

The LDA topic model can merge the semantic data of STA, resulting in a proficient word segmentation outcome. It computes the topics of these accomplishments based on the distribution of prominent words and evaluates the significance of each topic across various samples of STA advancements [5].

3. Intelligent Transformation Platform of STA based on LDA Topic Model Algorithm. The exchange of STA innovations between academic institutions and businesses faces numerous challenges. Existing platforms designed to transform these advancements struggle to offer precise recommendations, leading to

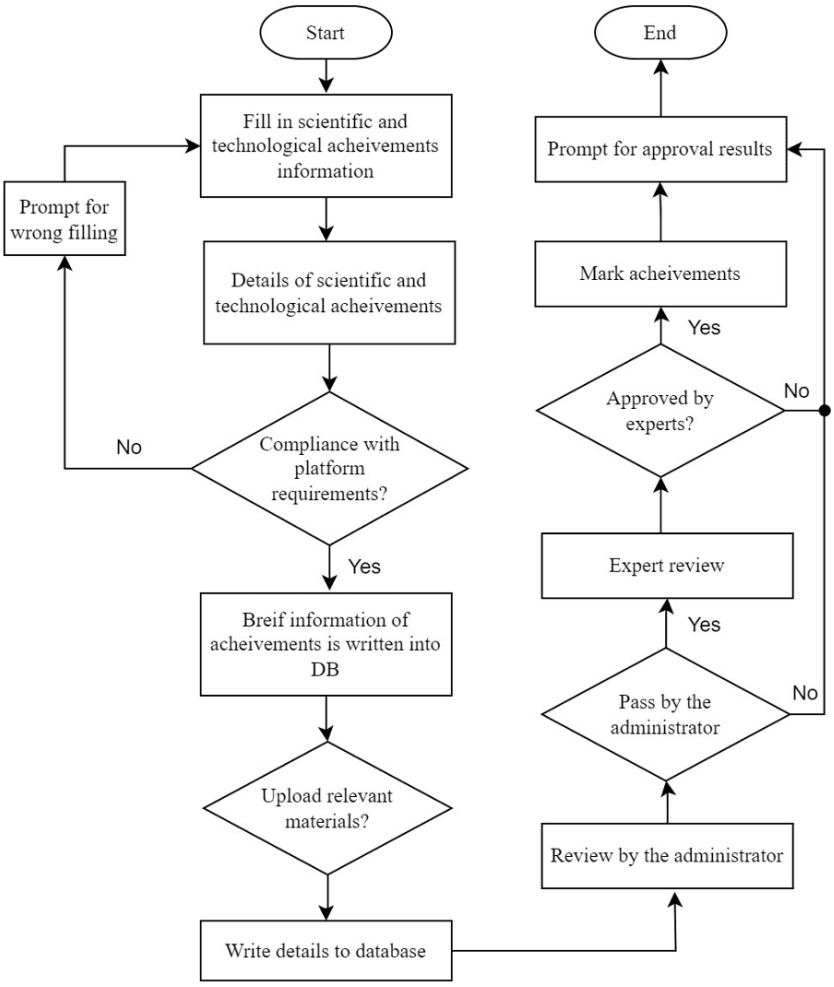

Fig. 3.1: Business process of information management subsystem.

difficulties for enterprises in identifying suitable innovations from a large pool of options. Consequently, the efficiency of this transformation process remains relatively low. To address these concerns, a platform based on the LDA topic model has been developed to facilitate the exchange of STA. The key objectives of this platform, as outlined are as follows [9]:

1. Management of information about the transformation of STA, encompassing tasks such as uploading achievements, data completion, and auditing, ensures comprehensive oversight of the achievement transformation process.
2. Implementing an intelligent retrieval and recommendation system for STA ensures the swift identification of the most compatible options.
3. Facilitating the trade of STA, including processing transaction applications, audits, and inquiries, streamlines the complex process of commercializing these innovations.
4. Facilitation of the transfer and delivery of STA, encompassing the completion of transaction reviews and the payment and delivery processes.

3.1. Information Management Subsystem of STA. The information management subsystem for STA oversees tasks such as uploading, addition, information enhancement, and review of these achievements, with patent achievements being the default. On the new STA page, essential details like the patent name, patent

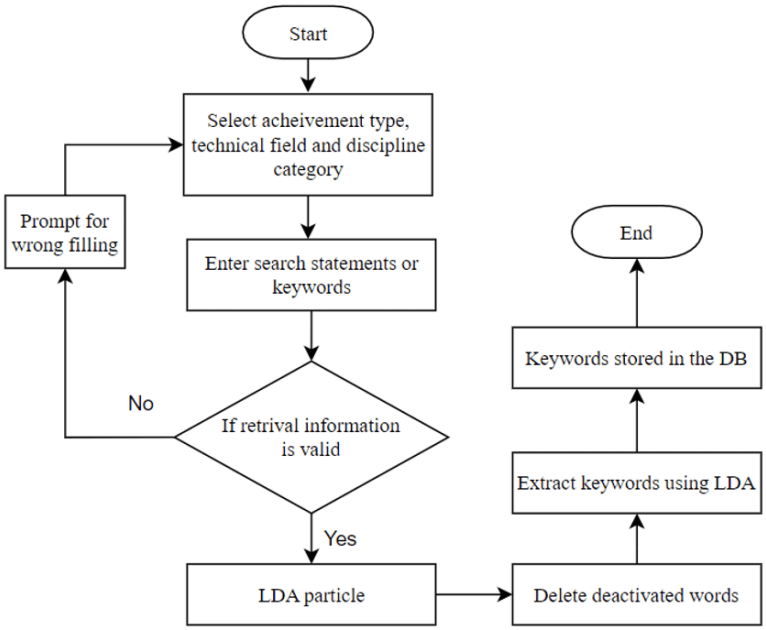

Fig. 3.2: Keyword extraction process of STA.

number, patent authorization date, and effective date must be filled out. Additionally, selecting the STA type and the subject category direction is required. Once the STA information is submitted, the format is assessed to ensure compliance with platform requirements. Subsequently, the information is forwarded to the platform system administrator for an initial audit. Upon approval during the initial audit, it is then directed to experts in relevant professional categories for a comprehensive review. Following the endorsement from the preliminary and substantive reviews, the LDA topic model algorithm is employed to categorize and label the STA. Ultimately, the platform notifies the responsible individual regarding the status of the STA. The business process flow of the STA information management subsystem is illustrated in Figure 3.1.

3.2. Intelligent Retrieval of STA and Recommendation Subsystem. The retrieval and recommendation subsystem within the STA transformation platform allows the seeker to acquire the desired transformation of STA swiftly. Unlike traditional platforms, which solely rely on keyword matching for STA searches and recommendations, this system efficiently retrieves achievements with identical semantics but varying keywords.

The intelligent retrieval process is segmented into two phases to address the challenge in retrieving STA: keyword extraction and keyword matching. During the keyword extraction phase, utilizing the LDA topic model enables the extraction of search keywords. Subsequently, in the keyword matching stage, the system matches these search keywords with those associated with STA. To ensure the usability of the extracted keywords for subsequent keyword matching, it is essential to store the obtained keywords from the extraction phase in the database. Figure 3.2 illustrates the keyword extraction process in retrieving STA.

During the keyword matching stage, the search keywords stored in the database are cross-referenced with the keywords and subject terms relevant to the STA. When a match is found, the search results display the recommendations of STA associated with the theme related to the keywords. Figure 3.3 illustrates the keyword-matching process in retrieving STA.

3.3. Transaction Management Subsystem of STA. The management subsystem for STA transactions oversees the processing and verification of transaction applications. The designated personnel responsible for STA provide essential transaction information on the platform's transformation page, including the name and method of transformation for the STA, the recipient's name for the achievements, and relevant account

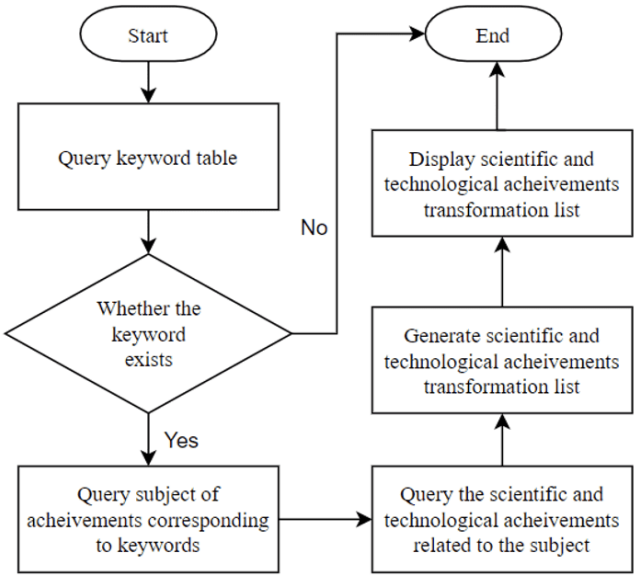

Fig. 3.3: Keyword matching process of retrieval of STA.

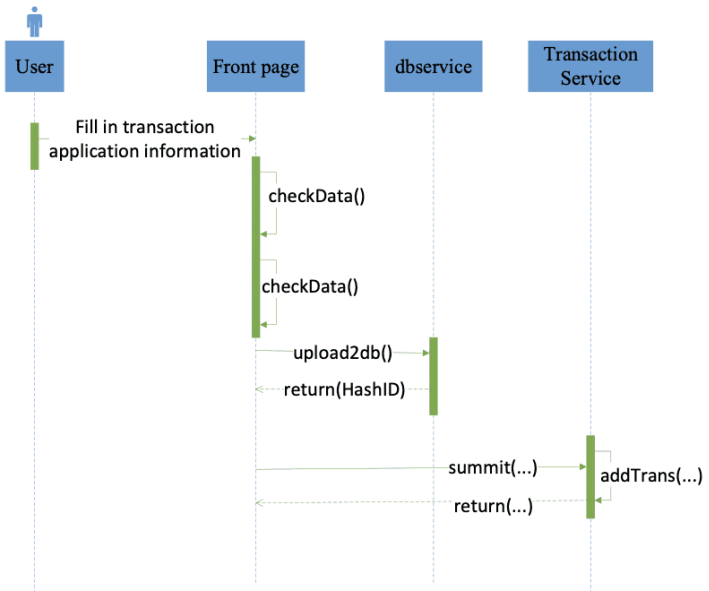

Fig. 3.4: Time sequence transactions of STA.

details. To prevent any instances of fraudulent conversions [15], comprehensive transaction contract materials must be uploaded to the conversion platform. The platform's front end ensures the logical integrity of the transaction information, validating and uploading accurate transaction details and materials to the database. Eventually, the completed parameters are transmitted to the transformation transaction service by the platform, culminating in the successful application process for STA transactions. The time sequence diagram depicting the application of STA is presented in Figure 3.4.

Table 3.1: Main fields of STA transformation.

Name of field	Type of field	Length of field	Description
Id	nvarchar	32	Number of STA
fieldId	int	8	Number of technical areas
title	nvarchar	255	Transformation title of STA
content	text	65535	Main content of STA transformation
postTime	Date	24	Publication date of STA transformation
dealObject	nvarchar	255	Transaction object of STA transformation

During the implementation of the transaction subsystem in the transformation platform, the individual overseeing STA fills out the transaction application information on the interface and submits it. Subsequently, the interface triggers the check_Information() method to validate the format and coherence of the transaction details. Furthermore, it invokes the before_Upload() function to manage the transaction materials before using the upload2db() method to upload the transaction data and materials to the database. The transaction service then uses the add_Trans() function to record the transaction information in the transformation table of STA. Ultimately, the processed data is returned to the interface. A comprehensive overview of the primary fields in the transformation table of STA is provided in Table 3.1.

3.4. Transaction Transfer Delivery Subsystem of STA. The transaction transfer delivery subsystem for STA finalizes the payment and delivery procedures associated with the transformation transactions. The transaction outcomes become visible on the information confirmation page within the STA transformation interface after completing the audit. It provides comprehensive details, including information on the STA, transaction amount, transaction contract, transformation method, and recipient information [14]. Upon reviewing and confirming the information, the transformation platform automatically updates the STA transformation status and secures the transaction amount from the recipient's platform account. Subsequently, following the transfer of ownership of the transactional achievements to the recipient, the locked transaction amount is released into the recipient's account, marking the culmination of the entire STA transformation process. The time sequence diagram depicting the transfer delivery of STA is presented in Figure 3.5.

During the implementation of the transaction transfer delivery subsystem within the transformation platform, the user accesses the STA transaction information through the front-end interface. The front-end triggers the loadFile() method to download the file about the STA transformation from the database and then displays it on the front-end interface. Following the user's confirmation, the front-end interface updates the ownership of the STA and secures the transaction amount in the recipient's account via the confirmTrans() method. Upon receiving and confirming the prompt for the ownership alteration of the returned STA, the front-end interface forwards the information to the backend purchase service. It initiates the transfer of the transaction amount to the recipient of the STA.

4. Transformation Results of STA. The metrics for assessing the transformation of STA encompass the status of the application, transformation revenue, input-output ratio, promotional progress, and funding for promotional projects. An achievement can be classified as a transformed STA accomplishment if it fulfils at least two criteria.

The application status is categorized into five groups [1]: industrial application, small-scale application, trial use, discontinuation after application, and non-application. "Industrial application" denotes the formal integration of the achievements into an industrial field, maintaining a stable application state. "Small-scale application" refers to intermittent, small-scale use post-production. "Trial use" describes the preliminary experimental application of the achievements before full implementation. "Discontinuation after application" signifies the cessation of use due to technical, financial, or strategic reasons. "Non-application" indicates that the achievements have not been practically utilized despite completing the initial transformation stages.

STA achievements in "industrial application" and "small-scale application" are considered completed transformations. Among the achievements on the platform, 303 meet the transformation criteria, accounting for

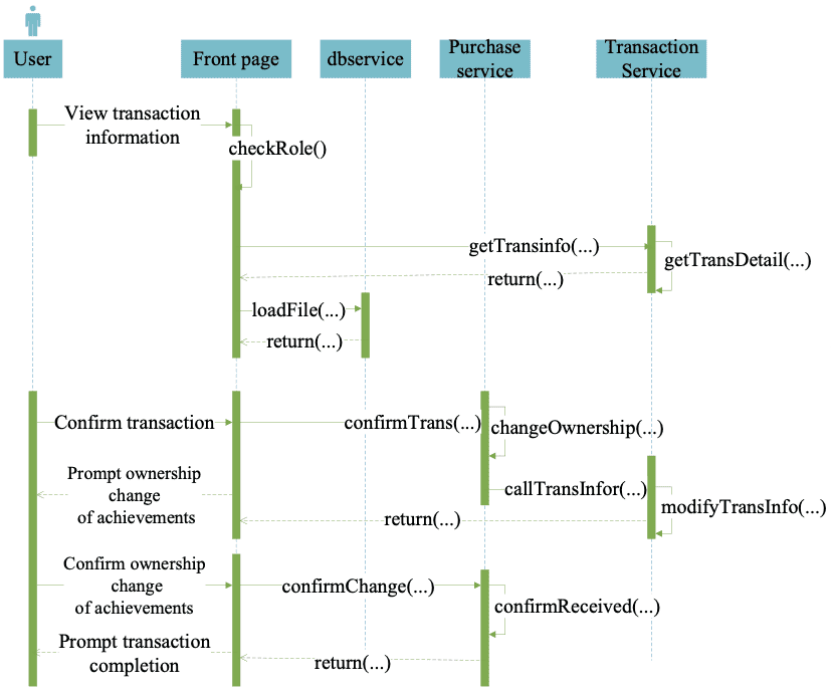

Fig. 3.5: Time sequence transfer delivery of STA.

74.81% of all STA. Specifically, there are 137 achievements in the state of "industrial application," accounting for 45.21% of the transformed achievements and 33.83% of the total achievements. Additionally, 166 achievements fall into the "small-scale application" category, comprising 54.79% of the transformed achievements and 40.99% of the total achievements. Furthermore, there are 48 achievements in the state of "trial use," constituting 15.84% of the transformed achievements and 11.85% of the total achievements. Moreover, 29 achievements are marked as "discontinuation after application," representing 9.57% of the transformed achievements and 7.16% of the total achievements. Finally, 25 achievements are classified as "non-application," making up 8.25% of the transformed achievements and 6.17% of the total achievements.

The promotion index entails a certain level of complexity, as the application of STA varies across different fields. Taking forestry as an example, its promotion involves [3]: (1) establishing a demonstration forest covering an area exceeding 300 acres; (2) cultivating over 5000 seedlings; (3) conducting at least ten training sessions, with a total of over 200 participants; (4) having more than one science and technology demonstration base; (5) operating at least one production line with an annual output value exceeding 1 million yuan.

Among the STA featured on the platform for STA transformation, a total of 196 achievements meet the transformation criteria. The percentage of achievements satisfying the conditions above stands at 44.39%, 28.57%, 14.29%, 7.65%, and 5.10%, respectively. The application and promotion of the transformation of STA are depicted in Figure 4.1.

Based on data from the STA transformation platform, analysis of various R&D subjects revealed that the enterprise sector had the highest transformation rate, reaching 86.25%. Technology promotion agencies followed closely, with a transformation rate of 70.81%. Additionally, research institutes and universities displayed transformation rates of 61.45% and 59.82%, respectively, while other institutions exhibited the lowest rate at 57.29%.

Regarding different fields, the statistics on the transformation of STA in the forest sector indicated that the field of forest-improved varieties boasted the highest transformation rate, reaching 70.24%. Subsequently, the transformation rates for forest management, pest control, forest product pricing, and ecological restoration

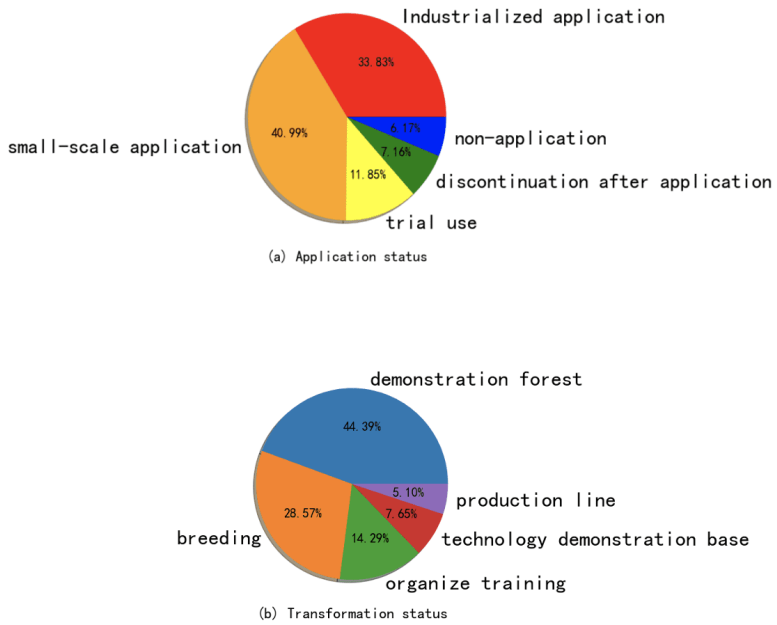

Fig. 4.1: Application and promotion of the transformation of STA.

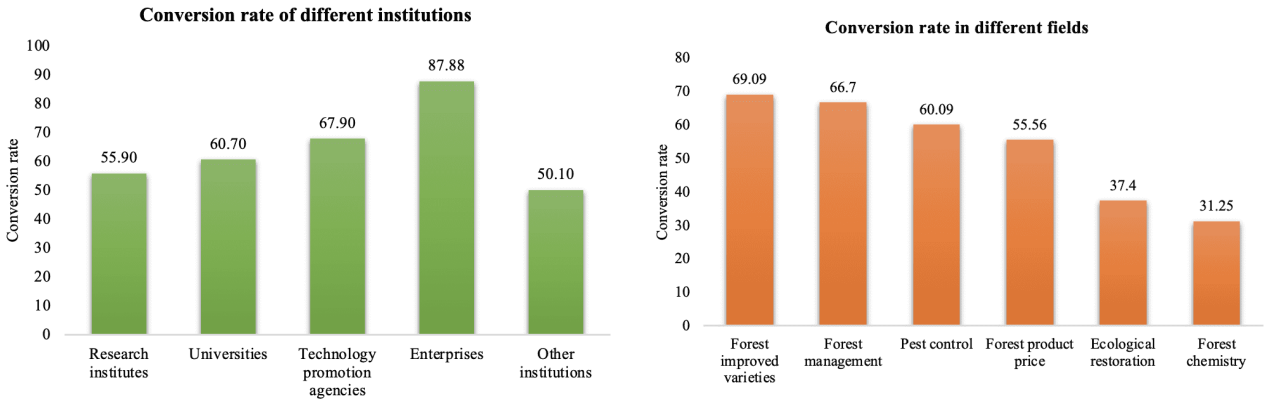

Fig. 4.2: Transformation rate of achievements in different R&D subjects and fields.

stood at 68.35%, 59.27%, 53.46%, and 37.4%, respectively. Notably, the field of forest chemistry exhibited the lowest transformation rate, at a mere 31.25%. Figure 4.2 showcases the transformation rates of achievements across various R&D subjects and fields.

The obstacles preventing the successful transformation of STA can be attributed to internal and external factors. External factors account for 73.53% of the total non-transformed achievements, with 75 STA affected. These primarily include challenges related to limited financing channels and management issues. Insufficient follow-up funding during the transformation process often hinders the progress of achievement transformation.

Additionally, some research and development sectors lack incentivizing mechanisms for converting scientific research achievements. Consequently, the efforts of achievement transformation personnel fail to yield commensurate returns, resulting in a decreased drive to convert research accomplishments.

Internal factors account for the remaining 26.47% of the non-transformed achievements, with 27 STA

Table 4.1: Weights of each index after standardization.

Index	2017	2018	2019	2020	2021
Income of achievements transfer	0.0259	0.0552	0.2156	0.2356	0.4677
Revenue from the sales of new products by the recipient enterprises	0.0031	0.0898	0.1745	0.229	0.5037
Income generated from the export sales of new products by the recipient enterprises	0.0724	0.0734	0.1043	0.2745	0.4754
Productivity of new products of transferee enterprises	0.0697	0.1063	0.14	0.2162	0.4679

impacted. This group includes instances where achievements fail to reach maturity or align with market demands, rendering them replaceable by newer innovations. Some achievements, originating from primary and pilot stages of research and development, may not meet the requirements of practical production and application. Additionally, although ahead of their time, certain innovations struggle to find suitable transformation prospects due to a misalignment with actual market demands.

4.1. Evaluation on Operation of Intelligent Transformation Platform for STA. Based on the preceding analysis of the scientific research achievements transformation platform, and guided by the principles of scientific rigor and practicality, evaluation indicators for assessing the operational performance of the platform have been identified. Drawing from pertinent research metrics [16], the chosen evaluation indicators encompass the following: achievement transfer revenue, sales revenue from the transferee enterprises' new products, export sales revenue from the transferee enterprises' new products, and the productivity associated with the transferee enterprises' new products.

First of all, it is necessary to standardize the data, which is as shown in Equation (4.1):

$$X'_{ij} = \frac{X_{ij} - \mathrm{Min}\,(X_{ij})}{\mathrm{Max}\,(X_{ij}) - \mathrm{Min}\,(X_{ij})} \tag{4.1}$$

wher, X_{ij} is the item j value of the i^{th} index, $\mathrm{Max}\,(X_{ij})$ is the maximum value of the item j value of the i^{th} index, $\mathrm{Min}\,(X_{ij})$ is the minimum value of the item j value of the i^{th} index, and X'_{ij} is the normalized value of X_{ij}.

Then the weight of each index is calculated by the entropy method, which is expressed in Equation (4.2):

$$H(X) = -\sum_{x \in X} P(x) \log(P(x)) \tag{4.2}$$

The weight of each index in the past five years after standardization is obtained, which is shown in Table 4.1.

The transformation ability of STA transformation platform is calculated according to Equation (4.3):

$$U = \sum W_{ij} X'_{ij} \tag{4.3}$$

where U is the comprehensive evaluation score, W_{ij} is the weight of item j of the i^{th} index, and $X'_{ij}$is the standard value of item j of the i^{th} index. The score of the platform for each year, as shown in Figure 4.3.

Figure 4.3 showcases a consistent upward trajectory in the score of the STA transformation platform. Despite a slight decline in 2019, the platform's transformative capacity has steadily grown.

5. Conclusion. The LDA topic model is conducted to address the substandard efficiency and quality during the transformation process of STA. In this paper, an intelligent transformation platform for STA, is developed. The STA information management subsystem is established to facilitate the seamless uploading, addition, refinement, and auditing of STA data. The intelligent retrieval and recommendation subsystem ensures swift access to potential users' desired STA. Moreover, the transaction management subsystem oversees the application and scrutiny of STA transactions. The transaction transfer delivery subsystem manages these

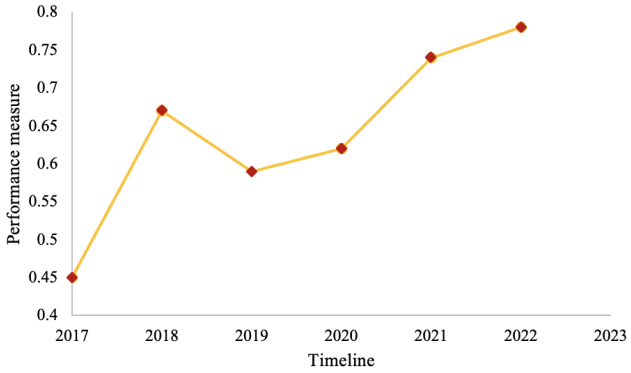

Fig. 4.3: Scores of transformation ability.

achievements' payment and delivery procedures. The analysis of the STA transformation platform is conducted from two perspectives, focusing on the transformation's outcomes and the operational evaluation of the platform itself. Taking a comprehensive view, both the transformation rate of STA and the overall rating of the transformation platform underscored the platform's capability to enhance the efficiency and quality of the transformation process significantly. The noticeable impact demonstrates the platform's effective application in streamlining the transformation of STA.

Funding Information. Key R&D Program of Shandong Province; Project Name: Evaluation of Scientific and Technological Achievements Transformation Ability of Scientific Research Institutes in Shandong Province and Research on Countermeasures to Promote the Transformation of Scientific and Technological Achievements; Project No.: 2021RKY01020.

REFERENCES

[1] S. Aziz, M. Dowling, H. Hammami, and A. Piepenbrink, *Machine learning in finance: A topic modeling approach*, European Financial Management, 28 (2022), pp. 744–770.

[2] T. Bhowmik, N. Niu, J. Savolainen, and A. Mahmoud, *Leveraging topic modeling and part-of-speech tagging to support combinational creativity in requirements engineering*, Requirements Engineering, 20 (2015), pp. 253–280.

[3] R. Congjing, S. Kai, et al., *The construction of the university transferability patent recognition model: A case analysis of artificial intelligence*, Information Studies: Theory & Application, 43 (2020), pp. 79–85.

[4] R. K. Gupta, R. Agarwalla, B. H. Naik, J. R. Evuri, A. Thapa, and T. D. Singh, *Prediction of research trends using lda based topic modeling*, Global Transitions Proceedings, 3 (2022), pp. 298–304.

[5] J. Hoblos, *Experimenting with latent semantic analysis and latent dirichlet allocation on automated essay grading*, in Proceedings of the 7th International Conference on Social Networks Analysis, Management and Security, Paris, France, 2020, IEEE, pp. 1–7.

[6] M. R. Jennings, C. Turner, R. R. Bond, A. Kennedy, R. Thantilage, M. T. Kechadi, N.-A. Le-Khac, J. McLaughlin, and D. D. Finlay, *Code-free cloud computing service to facilitate rapid biomedical digital signal processing and algorithm development*, Computer Methods and Programs in Biomedicine, 211 (2021), p. 106398.

[7] E. K. Karpunina, G. K. Lapushinskaya, A. E. Arutyunova, S. V. Lupacheva, and A. A. Dubovitski, *Dialectics of sustainable development of digital economy ecosystem*, in Scientific and Technical Revolution: Yesterday, Today and Tomorrow, vol. 129, Springer, 2020, pp. 486–496.

[8] V. L. Kvint and V. V. Okrepilov, *Quality of life and values in national development strategies*, Herald of the Russian Academy of Sciences, 84 (2014), pp. 188–200.

[9] W. Li and P. Zhang, *Developing the transformation of scientific and technological achievements in colleges and universities to boost the development of low-carbon economy*, International Journal of Low-Carbon Technologies, 16 (2021), pp. 305–316.

[10] F. F. Lubis, Y. Rosmansyah, and S. H. Supangkat, *Topic discovery of online course reviews using lda with leveraging reviews helpfulness*, International Journal of Electrical and Computer Engineering, 9 (2019), p. 426.

[11] S. Qomariyah, N. Iriawan, and K. Fithriasari, *Topic modeling twitter data using latent dirichlet allocation and latent semantic analysis*, in Proceedings of the 2nd International Conference on Science, Mathematics, Environment, and Education, vol. 2194, Surakarta, Indonesia, 2019, AIP Publishing.

[12] J. Song, Y. He, X. Sun, and D. Huang, *Research on innovation evaluation of scientific and technological achievements in colleges and universities in the new era*, in Proceedings of the 22nd International Conference on Computer and Information Science, Zhuhai, China, 2022, IEEE, pp. 176–181.
[13] A. Suominen and H. Toivanen, *Map of science with topic modeling: Comparison of unsupervised learning and human-assigned subject classification*, Journal of the Association for Information Science and Technology, 67 (2016), pp. 2464–2476.
[14] J. Wang, Y. Li, B. Wu, and Y. Wang, *Tourism destination image based on tourism user generated content on internet*, Tourism Review, 76 (2021), pp. 125–137.
[15] M. Wu, R. Long, F. Chen, H. Chen, Y. Bai, K. Cheng, and H. Huang, *Spatio-temporal difference analysis in climate change topics and sentiment orientation: Based on lda and bilstm model*, Resources, Conservation and Recycling, 188 (2023), p. 106697.
[16] D. Yao, J. He, W. Yang, and M. Zhang, *A study on the evaluation index system of innovation and entrepreneurship education for undergraduate students majoring in interdisciplinary arts and sciences.*, Higher Education Studies, 12 (2022), pp. 135–145.

Edited by: Venkatesan C
Special issue on: Next Generation Pervasive Reconfigurable Computing for High Performance Real Time Applications
Received: May 13, 2023
Accepted: Oct 22, 2023