

Knowledge Management Application for Small and Medium-Sized Service-Oriented Enterprises Based on the SECI Model

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Abstract—This paper analyzes the current situation and development bottlenecks of small and medium-sized service industry enterprises using the T nail salon as an example. It emphasizes the importance of knowledge management and proposes the need to establish a knowledge system within the company that combines both humanistic and technological aspects. From the practice of using the SECI model in the T nail salon, we can also conclude that small and medium-sized service-oriented enterprises can use appropriate means and less cost to achieve effective knowledge conversion among individuals, teams, organizations, and customers, achieve orderly knowledge management, and ultimately achieve a comprehensive effect of improving the quality of enterprise services and competitiveness.

Keywords—Knowledge management; Socialization Externalization Combination Internalization (SECI); nail salon; Small and Medium-Sized Enterprises (SMEs)

I. INTRODUCTION

The service industry plays an important role in promoting economic growth and improving employment. In recent years, global service-oriented enterprises have begun to explore the application of digital technology to reshape and upgrade their corporate structure, thereby achieving progress and improvement in product and service quality. However, in applying digital innovation to business practices, there still exists a series of problems, among which those faced by small and medium-sized service-oriented enterprises, which occupy an important position in the service industry, are more prominent.

Due to their low barriers to entry, low investment requirements, and low technological demands, to a certain extent, small and medium-sized service industries belong to a perfectly competitive market where there are many businesses, with simple services and little autonomy in pricing. They can only accept prices and provide homogeneous products to the market in a similar way. Fierce competition among peers is intensifying, leading to profit shrinkage seriously.

In this connection, small and medium-sized service-oriented enterprises are facing enormous survival pressure and challenges. Traditional homogeneous product forms and service models can no longer meet the personalized needs of the public. Only by accelerating the differentiation process of enterprises and innovating products and services can they find their competitive advantages. In this innovation process,

continuous knowledge accumulation is the foundation of innovation, and strong knowledge management capability is the key to it. Currently, the problems encountered by small and medium-sized enterprises (SMEs) in their growth process are precisely the difficulty in stimulating the potential of knowledge innovation, the difficulty in guaranteeing knowledge inheritance, and the obstacles to knowledge sharing. Many managers of SMEs believe that effective knowledge management requires changing the management mode of operation, leveraging digital technology, upgrading software configurations, and consuming a large amount of manpower and financial resources, which seems to be only affordable for large enterprises. In view of this, the knowledge management of small and medium-sized service-oriented enterprises should be guided by professionals and specific methods, which should be easy to understand, convenient to operate, low in cost, and able to produce results in the short term. In this study, with SECI knowledge conversion model in the knowledge management system applied, a T nail salon located in Shibuya, Tokyo, Japan is selected as a research case, and a knowledge management system framework suitable for the T nail salon is built based on the current knowledge management status of the T nail salon, providing guidance for the healthy operation and service upgrade of the T nail salon. SECI model is currently the most effective means of knowledge management, which can be used to promote the conversion of tacit and explicit knowledge. Since its proposal, it has been widely applied in hospitals, enterprises, schools, etc., and its effectiveness has been fully verified. However, life beauty enterprises such as the T nail salon have not yet attempted it. The T nail salon belongs to a relatively typical small and medium-sized service-oriented enterprise. We believe that the knowledge management solution proposed based on SECI model is also applicable to a large number of small and medium-sized service-oriented enterprises to a certain extent, and has certain reference value and significance for the healthy growth of such enterprises.

A. Need of the Study

This research highlights the crucial need for small and medium-sized enterprises (SMEs), particularly service-oriented businesses like T Nail Salon, to adopt effective knowledge management practices. SMEs often struggle to fully leverage knowledge innovation and face challenges in

transferring and retaining knowledge when employees depart. Businesses can safeguard valuable insights and expertise by implementing a well-organized knowledge management system. The study also addresses issues related to knowledge sharing, proposing practical and cost-effective methods and technologies easily adoptable by smaller firms. Using the SECI knowledge conversion model, the research offers a systematic approach to converting tacit knowledge into explicit knowledge. Ultimately, the study emphasizes that establishing a robust knowledge management system is vital for improving business performance, driving service enhancements, and ensuring sustainable growth in SMEs, providing valuable insights for managers and industry practitioners.

In the paper, after the introduction section, the organization follows a structured approach to explore the current knowledge management (KM) issues in a small and medium-sized enterprise (SME) and propose solutions based on the SECI model. The remaining of the paper is organized as follows: Section II discusses the literature review of the proposed model; then Section III and its sub-sections discuss the research methodology of the study; further, the current status of knowledge management in the T nail salon is explained in Section IV and its sub-sections; then, the construction of T nail salon knowledge management system based on SECI model is elaborated in Section V; then, Section VI elaborates the results attained by the study; then, Section VII represents the discussion of the study; finally, Section VIII concludes the overall summary of the paper and Section IX discusses the limitations of the study.

II. LITERATURE REVIEW

The literature review encompasses a diverse range of references that contribute to understanding knowledge management within organizations. The study [1] defines the knowledge-based economy, categorizing knowledge into four types: Know-what, Know-why, Know-how, and Know-who, although specific results for this reference are not detailed in the paper. In [2], the author emphasize the importance of intelligent knowledge management, noting its critical role for organizations to navigate and utilize knowledge effectively, but again, results are not specified. In [3], the author offers a conceptual analysis that differentiates between explicit and tacit knowledge, though it presents limited examples of practical applications in organizational settings. The study in [4] develops theories surrounding organizational knowledge creation, enhancing the understanding of implicit and explicit knowledge dynamics, yet it lacks empirical validation across various organizational contexts. The operationalization of tacit knowledge is discussed by [5], who highlights challenges in measuring such knowledge, indicating that results may not generalize across different industries. The study in [6] explores how tacit knowledge drives innovation processes, though specific examples of its impact are somewhat limited. In [7], the author provides an overview of knowledge management practices, advocating for a systematic approach to enhance organizational performance, but there may be potential bias due to anecdotal evidence and varied industry applications. The study in [8], review knowledge management systems and their frameworks, identifying key components that boost organizational efficiency, although theoretical insights may not capture the complexities of real-world scenarios. The

authors in [9], analyzes customer knowledge management, emphasizing the role of customer insights in shaping business strategies while noting that the focus may be too narrow, overlooking internal knowledge dynamics. In [11], the author discuss the integration of customer relationship management and knowledge management, providing a framework for managing customer knowledge to improve performance, though it may lack comprehensive case studies to substantiate theoretical findings. Finally, [15] contributes to the literature with a unified model of dynamic knowledge creation, introducing the SECI model as a pivotal framework for knowledge conversion, yet its application is limited to specific industries, necessitating broader validation. This comparative analysis contextualizes the references in the literature review, offering insight into each work's methodology, findings, and limitations for a more comprehensive understanding of knowledge management within SMEs. Table I represents the comparison of the existing models,

III. RESEARCH METHODOLOGY

A. Knowledge

Knowledge is a kind of optimal resource, filled with people's lives. The knowledge of the Organization for Economic Cooperation and Development, OECD) can be divided into four types: Know what, Know why, Know how and Know who [1]. Knowledge can guide human thinking and behavior and is the correct experience and insight accumulated by human beings themselves [2]. There are different classification methods for knowledge. Polanyi first proposed in 1962 that knowledge can be divided into explicit knowledge and implicit knowledge [3]. The Japanese researcher Ikujiro Nonaka's work has further deepened the understanding of implicit and explicit knowledge [4]. Explicit knowledge can be recorded and retained through specific forms and methods, such as text and graphics. Tacit knowledge is the experience and skills accumulated through people's work and study, which are generally difficult to describe and identify, with highly personalized characteristics, so it is difficult to imitate and copy. From the perspective of academic research, it is also challenging to incorporate it into the quantitative research framework [5]. The successful experience and skill concept contained in the enterprise is the source of enterprise innovation, and the mining of this tacit knowledge is crucial to the development of enterprises [6].

B. Knowledge Management

In the concept of knowledge management proposed by Arthur Andersen Business Consultant, knowledge management is defined as:

$$KM = (P + K)^S$$

KM stands for Knowledge Management; P means people, teams, organizations, etc; K refers to knowledge and activities related to knowledge; " + " refers to the technology, method, and tool, and S is the dynamic process of sharing. In this formula, knowledge management should also be supplemented by environmental factors such as consciousness, culture, and institutions.

TABLE I. COMPARISON OF EXISTING MODELS

Reference	Methodology	Results	Limitations
1	Defines the concept of a knowledge-based economy.	Knowledge is categorized into four types: Know-what, Know-why, Know-how, and Know-who.	Not specified in the paper for this reference.
2	Discusses intelligent knowledge management.	Knowledge management is crucial for organizations to navigate and utilize knowledge effectively.	Not specified in the paper for this reference.
3	Conceptual analysis of personal knowledge.	Differentiation between explicit knowledge and tacit knowledge.	Limited examples of practical application in organizations.
4	Theory development on organizational knowledge creation.	Deepened understanding of the dynamics between implicit and explicit knowledge.	Lacks empirical validation in various organizational contexts.
5	Operationalization of tacit knowledge.	Discussion of the challenges in measuring tacit knowledge within organizations.	Results may not generalize across different industries.
6	Explores the link between tacit knowledge and innovation.	Highlights the importance of tacit knowledge in driving innovation processes.	Specific examples of tacit knowledge's impact may be limited.
7	Provides a comprehensive overview of knowledge management practices.	Stresses the importance of a systematic approach to knowledge management to enhance organizational performance.	Potential bias due to anecdotal evidence and varied industry applications.
8	Review of knowledge management systems and frameworks.	Identifies key components and benefits of knowledge management systems in enhancing organizational efficiency.	Theoretical insights may not reflect the complexities of real-world scenarios.
9	Analysis of customer knowledge management.	Emphasizes the crucial role of understanding customer knowledge in shaping business strategies.	The focus may be too narrow, not accounting for internal knowledge dynamics.
11	Discusses integrating customer relationship management and knowledge management.	Provides a framework for effectively managing customer knowledge to improve business performance.	It may lack comprehensive case studies to support theoretical findings.
15	Development of a unified model of dynamic knowledge creation.	Introduces the SECI model as a key framework for knowledge conversion.	Limited application to specific industries, needing broader validation.

Knowledge management can be defined as acquiring, mining, and utilizing the knowledge possessed by human beings through certain means and methods to increase the wisdom and ability of the organization and improve the performance of the enterprise [7]. This process includes knowledge identification and acquisition, knowledge dissemination and sharing, knowledge innovation and creation, and knowledge utilization and application [8]. Knowledge management is not limited to the internal personnel of the organization but also includes the knowledge of the enterprise's stakeholders, including competitors, upstream and downstream supply chains, customers, etc.

Among them, the collection, extraction, and management of customer knowledge is an essential part. Customer knowledge refers to customers' attitudes towards products and services, their specific needs, experiences, psychological models, behavioral preferences, etc. [9], and even customers' expectations for the future. Customer knowledge plays a very important role in the development of marketing strategies [10].

Customer knowledge can be divided into four types according to its different attributes: that is, knowledge about customers, which mainly includes the explicit data of customers at the time of the transaction, such as customers' age, address, and contact information; The knowledge required by the customer is the knowledge that the enterprise passes to the customer to meet the needs of the customer so that it can quickly locate the product or service required by the customer; Knowledge from the customer, that is, the customer's needs, perceptions, experiences of the product or service; The knowledge created by enterprises and customers, that is, the new product development strategies and service means generated by mutual communication and joint discussion between enterprises and customers in the transaction process [11].

It can be seen from the knowledge management formula that the implementation of enterprise knowledge management includes: Establishing effective internal incentive mechanisms, such as intellectual property incentives [12], organizational level rewards [13], process incentives [14], and control mechanisms. These incentive mechanisms have positive effects on in-

dividual knowledge-creation behavior. Information technology support can promote the organization's knowledge collection and knowledge connection activities, and promote knowledge creation; The strengthening of leadership can have a positive impact on knowledge creation [15][16][17][18][19]. A collaborative and compatible organizational culture can reduce intra-organizational conflicts [20], thus promoting knowledge transfer and sharing within the organization [21]. Yallamelli [22] explores the effects of cloud computing on the management accounting processes of small and medium-sized enterprises (SMEs). Employing a multi-method approach, it examines how cloud computing improves financial data management, boosts operational efficiency, and supports decision-making. The findings indicate that cloud-based accounting systems offer enhanced real-time access to data, facilitating regulatory compliance and strategic decision-making. However, challenges such as data security, privacy issues, and the need for extensive employee training and effective change management remain. Knowledge is essential for production and long-term organizational growth. Knowledge Management (KM) is key in integrating organizational knowledge to drive strategic planning and sustainable success. Allur et al. 2025 introduces Adaptive Heterogeneous Structural Equation Modeling (AHSEM) as an effective tool for strategic business planning based on the KM process. A major factor contributing to the failure of KM initiatives is the absence of a clear development strategy. The paper examines the strategic planning needs for successful KM implementation and proposes a framework to help organizations manage the process. The numerical results demonstrate superior performance compared to other methods [23].

C. SECI Model

SECI model is a theoretical framework used to describe the process of knowledge conversion within and between organizations. It consists of four processes: Socialization, Externalization, Combination, and Internalization, aimed at facilitating knowledge creation, sharing, and application to drive organizational learning and innovation. These stages depict

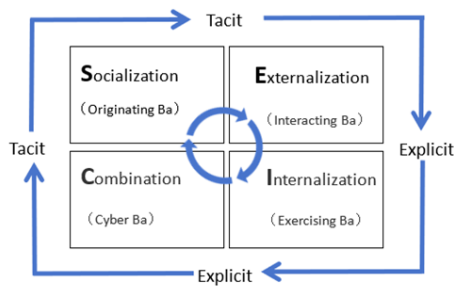


Fig. 1. SECI Model.

the transfer and integration of knowledge from individuals to organizations, involving the transformation of knowledge from tacit to explicit and vice versa. In this model, knowledge conversion is a dynamic cyclical process involving interactions among individuals, teams, and organizations. Socialization involves individuals sharing personal experiences and knowledge with others, enabling the externalization of tacit knowledge. Externalization refers to the transformation of tacit knowledge into explicit knowledge, typically through verbalization, writing, imagery, etc. Combination involves integrating different explicit knowledge elements to create new forms of knowledge. Finally, Internalization refers to the retransformation of explicit knowledge into an individual's tacit knowledge, enabling individuals to apply it in practical contexts (Fig. 1).

Based on previous literature, SECI (Socialization, Externalization, Combination, Internalization) model has made significant progress in the fields of organizational learning and knowledge management, demonstrating numerous positive aspects alongside some challenges. Firstly, SECI model provides a robust framework for organizations to facilitate knowledge creation, sharing, and application. By delineating knowledge conversion into distinct stages, SECI model helps organizations better understand the process of knowledge conversion, making knowledge management more systematic and actionable. This systematic approach aids organizations in more effectively planning and implementing knowledge management strategies, thereby enhancing the efficiency of knowledge creation and application [21].

Furthermore, SECI model emphasizes the importance of interaction and collaboration between individuals and groups in knowledge conversion. In the socialization stage, individuals convert personal knowledge into shared group knowledge through interaction and communication, thereby fostering teamwork and co-creation. This socialization process contributes to fostering common values and culture within organizations, enhancing team cohesion and innovation capability [21].

Additionally, SECI model underscores the importance of individual learning and knowledge internalization. In the internalization stage, organizations internalize shared knowledge into individuals' tacit knowledge through learning and understanding, thereby promoting individual learning and growth. This individual learning process helps to improve employees' abilities and qualities, enhancing organizational competitiveness and innovation capability. Research in the field of tacit knowledge management is also diverse, some scholar investi-

gated the relationship between tacit knowledge and competitive advantage, finding a positive and significant association between them [24]. Tacit knowledge is based on practical intelligence rather than knowledge or academic knowledge [25]. Tacit knowledge comes from experiential training, and organizational learning often focuses on how things are done rather than why they are done. Furthermore, understanding the knowledge conversion process of SECI requires verification of its applicability in multi-organizational projects. Several notable case studies have demonstrated knowledge transfer and sharing among multiple organizations, illustrating the potential of SECI model in this regard. For example, projects like the "Home Bakery" project developed by Matsushita Electric Industrial Co., Ltd. and the personal computer project developed by NEC showcased knowledge transfer and sharing across organizational boundaries [21]. Taking Matsushita Electric Industrial Co., Ltd. as an example, the application of SECI model in the "Home Bakery" project involved organizing cross-organizational meetings and workshops where employees from different departments could directly exchange and share experiences. These meetings and workshops provided a platform for employees to discuss issues, share insights, and solve challenges face-to-face, thereby promoting knowledge socialization. Additionally, through note-taking, report writing, or presentation-making during these meetings and workshops, Matsushita Electric Industrial Co., Ltd. converted internal tacit knowledge into external explicit knowledge. Through these documents and presentations, the company transformed internal expertise and experience into shareable and understandable forms, facilitating learning and application by other organizations. Furthermore, Matsushita Electric Industrial Co., Ltd. organized cross-departmental collaborative research and development teams to integrate and collaborate on knowledge and resources from different departments. Through such cross-departmental collaboration, the company could cross-fertilize knowledge and experience from various fields, promoting innovation and problem-solving. During the project implementation process, Matsushita Electric Industrial Co., Ltd. encouraged employees to internalize external knowledge into their tacit knowledge and apply it to practical work. The company actively provided training and development opportunities to help employees internalize external explicit knowledge into internal tacit knowledge and incorporate it into the company's daily practices and culture.

Although some studies attempt to validate the correlations between different factors in SECI model through psychometric measures, the complexity and subjectivity of tacit knowledge make this task highly challenging [25].

D. SECI Model Application

The main body of knowledge management implementation based on SECI model is individuals, teams, and organizations, which are interrelated and influence each other to a certain extent, and their purpose is to jointly affect all kinds of resources formed in the process of knowledge innovation. In this process, the key is people-oriented, with knowledge as the content, and information technology as an important means. As mentioned above, the practice based on SECI model has been applied in universities, hospitals, enterprises, etc. To illustrate the practical application of SECI model in corporate settings, take Siemens AG as an example. This multinational

conglomerate has skillfully integrated SECI model to refine its technical and innovative management strategies. The establishment of online forums and repositories has effectively facilitated the socialization and externalization stages within the corporation, enabling employees to share and archive knowledge with minimal effort. During the combination phase, the organization's internal network has been strategically utilized to amalgamate these diverse knowledge assets, which has catalyzed the development of innovative technologies and solutions. Progression to the internalization phase has been achieved through systematic workshops and training programs, designed to ensure that employees not only assimilate but also effectively implement this accrued knowledge. These strategic measures have markedly enhanced the rate of innovation and fortified collaborative efforts across the company's global teams.

Pfizer's strategic implementation of SECI model during the expedited development and scale-up of COVID-19 vaccine production serves as a paradigmatic example of effectively managing risk within the pharmaceutical industry. In the Socialization Phase, Pfizer orchestrated extensive interdisciplinary meetings, enabling a rich exchange of tacit knowledge among researchers, production personnel, and quality assurance teams regarding innovative vaccine production technologies and associated safety challenges. Subsequently, during the Externalization Phase, the insights gleaned from these discussions were systematically transformed into comprehensive safety protocols and best practices, which were codified to standardize operations across Pfizer's global production facilities. The Combination Phase involved the deployment of a sophisticated digital platform that consolidated these newly formulated protocols with existing knowledge repositories, thus ensuring consistent application of safety and quality standards worldwide. In the Internalization Phase, Pfizer conducted a series of global workshops and simulation-based training sessions, which facilitated the assimilation of these standardized procedures by staff across various departments, thereby enhancing their capacity to promptly and accurately address potential production discrepancies or risks. This proactive application of SECI model not only navigated the complexities associated with the rapid scale-up of vaccine production but also safeguarded the uniformity and efficacy of the vaccines distributed globally, underscoring the model's effectiveness in enhancing operational safety and risk management in high-stakes environments.

Google has effectively harnessed SECI model to enhance both safety and innovation. Through regular safety lectures and training seminars, the company promotes systematic knowledge sharing, which aids in the early identification and management of potential risks. By transforming tacit knowledge into explicit documentation and integrating these insights into comprehensive risk management strategies, Google not only ensures that all employees are well-informed but also fosters a culture of trust and collaborative innovation. This approach enhances the robustness of Google's AI technologies, promoting the development of safer, more reliable applications that adhere to ethical standards and regulatory requirements. Moreover, the proactive engagement of employees across departments deepens the organizational understanding of AI, fostering an environment of proactive risk assessment and continual innovation. Google's strategic use of SECI model not only



Fig. 2. Beauty salon market size in 2024.

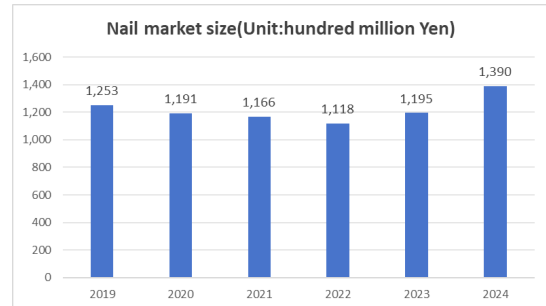


Fig. 3. Nail market size.

mitigates risks but also reinforces its commitment to ethical AI development, setting a benchmark for industry practices.

IV. THE CURRENT STATUS OF KNOWLEDGE MANAGEMENT IN THE T NAIL SALON

A. Industry and Company Overview

Nail salons are part of the beauty industry, a sub-industry under the service industry. The beauty industry has evolved from being a flexible demand for women to a rigid demand for everyone, including beauty, hairdressing, and nail care. According to the data of beauty census and population estimates (Bureau of statistics, ministry of internal affairs and communications, JAPAN), until August 2024, the market size of Japan's beauty industry reached 2.6496 trillion yuan, an increase of 5.3% over 2023. As Fig. 2 and Fig. 3 show, the market size of hairdressing took up a significant proportion (51.1%), followed by beauty (14.9%). Nails accounted for 51.1%, and the scale of nails reached 139 billion yuan, an increase of 16.3% over the previous year.

These physical stores face fierce competition due to small investment, and simple techniques. In the nail industry, there are over 300 nail salons just in the Shibuya-ku of Tokyo, Japan. The T nail salon is located in the Shibuya-ku commercial district of Tokyo, Japan, and has 13 female employees, including 1 manager and 12 manicurists.

Since its establishment, the T nail salon has placed great emphasis on the skills and service level of its employees. It adopts the form of an apprenticeship team (forming 3 groups, each consisting of a senior nail technician, an intermediate nail technician, a junior nail technician, and an apprentice basically) to encourage them to learn from each other, exchange experiences, and improve their service level. A senior

nail technician with relevant management experience is hired as a store manager to be responsible for basic operational management within the store.

B. The Current Status of Knowledge Management in the T Nail Salon (Based on SECI Model)

To have a more comprehensive understanding of the knowledge management status of the T nail salon, a survey of all personnel in the salon has been conducted, including anonymous questionnaires, open-ended questions, and random discussions. Based on this work, these contents are recorded and classified in detail.

1) *Tables I to IV show background information of T Nail Salon personnel (except the boss):* Tables II to V offer essential background information regarding the team at T Nail Salon, omitting the owner and highlighting their educational credentials, work history, age, and technical positions. Table II details the academic qualifications of the employees, including one individual with a Master’s degree, two possessing undergraduate degrees, and the majority (10 employees) having graduated from vocational school. This blend emphasizes a harmony between advanced academic understanding and targeted vocational education, both crucial in a service-focused sector. Table III details the workforce’s experience, dividing them into four categories: three employees with more than five years of experience, four with 3-5 years, three with 1-3 years, and three with under one year. This mix of experiences guarantees a varied skill set, promoting chances for mentorship and knowledge sharing within the team. Table IV outlines the age distribution of the staff, consisting of five employees aged 20-30, four in the 30-40 bracket, and four employees above 40. This varied age spectrum combines youthful vigor, flexibility, and extensive industry experience, aiding in meeting the diverse requirements of clients. Table V showcases the technical roles occupied by the staff, featuring three in senior roles, three at the intermediate grade, three designated as junior technicians, and four apprentices. This framework enables a clear separation of duties, with senior personnel directing and advising junior staff, fostering a nurturing educational atmosphere. In summary, these tables showcase a varied and talented team possessing different degrees of experience and proficiency, establishing a robust basis for executing successful knowledge management strategies in the salon.

TABLE II. EDUCATIONAL BACKGROUND

Educational background	Master	Undergraduate	Vocational School
Number of people	1	2	10

TABLE III. WORK EXPERIENCE

Work experience (Year)	> 5	3-5	1-3	1
Number of people	3	4	3	3

2) *General interview questions in knowledge management:* Such as whether you have heard of knowledge management, whether you are satisfied with the atmosphere and management of the T nail salon, whether you have long-term plans to work here, whether the office software is easy to use, and whether you can establish close relationships with customers.

TABLE IV. AGE OF EMPLOYEE

Age of employee (Year)	20-30	30-40	> 40
Number of people	5	4	4

TABLE V. TECHNICAL TITLES

Technical titles	Senior	Intermediate	Junior	Apprentice
Number of people	3	3	3	4

According to different roles and responsibilities, some personalized questions have been set up. For example, as a teacher of an apprenticeship group, are you willing to teach your apprentices? As a student, do you admire your teacher and are willing to accept her guidance and help? Do you feel that you have made progress and improved from it? As a store manager, how do you ensure the effectiveness of training? Do you have specific measures to cultivate good cooperation among employees? How often do you update the database? Do you have specific methods to maintain old customers and develop new ones? As the boss, how often do you visit the store? Can employees contact you directly? How do you view competitors and substitutes in the market?

3) *From the research:* It can be seen that the T nail salon currently does not carry out any activities related to knowledge management. Employees do not have a positive attitude towards knowledge management, and both managers and ordinary employees have a blank understanding of the content, requirements, and implementation steps of knowledge management. In this survey, special attention was paid to the respondents’ answers to open-ended questions, such as “What role does knowledge management play in the development of enterprises” and “How should knowledge management be implemented specifically”. These questions are closely related to SECI model in knowledge management and to the respondents’ knowledge, values, and vision for enterprise development. They also have important reference value for how to better apply knowledge management to enterprise management in the next step (Table VI).

“I have heard of performance management, and financial management, but what is knowledge management? Our nail salon is a traditional small service-oriented enterprise. With limited manpower, why should we spend time and effort on knowledge management? Those are things that should be considered by companies with a certain scale of employees and economic benefits. If we have time and money, let’s advertise and promote more”. (the boss: Mr. Song)

“Nail technicians should focus on improving their skills, so why do we need to engage in knowledge management? Will my workload increase like this? Will the company compensate me for the extra workload?” (Senior nail technician: Hui)

C. Problems with Knowledge Management in the T Nail Salon (Based on SECI Model)

In view of the current situation of knowledge management in the T nail salon, this chapter starts from the different requirements of knowledge management at various stages, carefully analyzes the main reasons SECI knowledge conversion process

TABLE VI. INTERVIEW EXCERPTS

<p>Socialization</p> <p>"I don't really want to share my experience. If I teach the apprentice, then what should I do?"</p> <p>"Although I have a teacher, she doesn't seem very willing to teach me knowledge. She often just brushes me off with things that everyone already knows. I didn't learn anything practical from her."</p>
<p>Externalization</p> <p>"I have not received higher education and have always focused on improving my technical skills, but if you ask me to express my design ideas and inspiration, I wouldn't know how to articulate them. I have a lot of thoughts in my mind, but I don't know how to explain them."</p> <p>"I feel that I am not very good at dealing with clients. If clients express their thoughts in a more subtle way, I am not very able to accurately understand them."</p>
<p>Combination</p> <p>"I can learn knowledge from the apprentice group, but I don't have a channel to learn about the knowledge of other groups. I also want to communicate and communicate more with other nail technicians."</p> <p>"Our styles and techniques are only updated once every three months, which makes it a bit difficult to keep up with the changing market trends. Additionally, I feel that many of our styles and techniques have become outdated and obsolete, yet they are still included in our operating manual."</p>
<p>Internalization</p> <p>"I found that when chatting with customers, they often have difficulty knowing about our new products and services. The relationship between customers and nail salons is also not close, and customers are easily attracted by new styles or low prices offered by other stores."</p> <p>"For many new styling techniques, T Nail Salon did not provide me with many opportunities to practice. Even now, there are some new techniques that I still cannot use proficiently."</p>

cannot be effectively promoted in practical operations, and provides a basis for formulating improvement and optimization measures.

1) *Insufficient motivation for acquiring and sharing tacit knowledge (Socialization)*: Firstly, the apprenticeship system has poor practical results, and the motivation of the master is not strong. Due to the competitive relationship between master and apprentice, the master is concerned that the sharing of knowledge between them may lead to a decrease in personal competitive advantage, and there is a possibility of "teaching the apprentice, starving the master". One of the important advantages that technical personnel have in the industry, company, and department is their skills, abilities, and experience, which are somewhat irreplaceable. In order to protect their own interests and positions, the master is unwilling to highly personalize and privatize tacit knowledge for sharing, which creates "knowledge sharing hostility" and "knowledge hoarding" [26] behaviors, to a certain extent, increasing the difficulty of sharing tacit knowledge within the enterprise.

Secondly, the master-apprentice relationship is weakened

and the sense of authority worship is weak. As an apprentice who receives knowledge, the lack of trust in the master's knowledge can easily lead to "knowledge rejection" behavior [27][28]. This behavior is more of a "not created by me syndrome" [29][30], preferring to create knowledge on their own rather than accepting guidance from a master.

Thirdly, the high employee turnover rate makes it difficult to ensure knowledge transfer. Although the T nail salon has only been open for less than half a year, there have already been two cases of nail technicians resigning. The tacit knowledge they possess, such as project experience and technical skills, cannot be passed on in a timely manner. This knowledge is often unique and difficult to replicate, even if the company recruits new employees, it cannot compensate for the loss of this knowledge.

Fourth, there are barriers to client knowledge exchange and communication channels are not smooth. Due to the different professions and backgrounds of customers and nail technicians, there is a significant difference between them. There is a certain difficulty in knowledge exchange without communication and interaction. The gatherer of customer knowledge (manicurist) and the owner (customer) come from different organizations, with no system or constraint to compel them to share knowledge. Enterprises and customers belong to two different interest entities. Customers are concerned that the enterprise knowing their information will cause an information asymmetry situation. Out of concern for their own privacy, they are unwilling to engage in indiscriminate knowledge exchange with the enterprise.

2) *Insufficient ability to convert tacit knowledge into explicit knowledge (Externalization)*: Firstly, the experience of a nail technician has characteristics such as tacit knowledge, irrationality, and situationality. The personal qualities, observational abilities, and professional experiences of the T nail salon employees vary greatly, resulting in different translations of tacit knowledge for clients. Externalization has certain requirements for everyone's ability to express in writing, ability to explain, and ability to summarize. Due to the limited cultural level of the vast majority of manicurists, there is a certain difficulty in expressing tacit knowledge and techniques into understandable words, concepts, figurative language, or images.

Secondly, the T nail salon holds apprentice group discussions and reviews at the end of each workday, followed by documentation. However, the lack of supervision over the quality of the written documentation has led to most nail technicians being negligent over time. The quality of the recorded content is low, lacking depth and value, and cannot be converted into explicit knowledge that the company can retain and utilize.

Thirdly, the T nail salon, due to limited funds, currently only uses the customer analysis function provided by the Japanese appointment website to record customer consumption and number of visits. They have not adopted more professional customer management software to record, classify, and integrate explicit knowledge data of customers. Employees are unable to obtain more customer knowledge from the existing website, let alone extract the tacit knowledge from the massive customer data and convert it into various easy-to-understand,

conceptualized, and standardized explicit knowledge.

3) *Single processing method of explicit knowledge (Combination)*: In the T Nail salon, the store manager writes the technical operation manual and opinion book to record the skills and craftsmanship of individuals and groups, which is the current unified service manual of the store. This is the service manual currently applied by the store. The current problem is that there is an obvious lag and omission in the collection and updating of such information. The classification and editing of data using only Office software appears cumbersome and chaotic. Users are unable to quickly locate the desired information, resulting in low knowledge utilization efficiency. There is no way to systematically integrate and edit the scattered explicit knowledge of the group, thereby forming a new and more advanced explicit knowledge system.

4) *Few opportunities for the conversion of explicit knowledge to tacit knowledge (Internalization)*: Firstly, the T nail salon currently uses the storage function provided by the appointment website as a database, but this database is not updated in a timely manner and is not convenient to access. The update permissions are concentrated in the store manager, and ordinary employees do not have permission to provide feedback or suggestions. Insufficient timely promotion and explanation of the updated database also resulted in the inability to provide nail technicians with new learning and practical opportunities. The newly formed explicit knowledge is not understood, accepted, and applied to work practice by organizational members without practice and experience, thus forming new personal experiences, styles, skills, and another tacit knowledge.

Secondly, the application and feedback channels of customer knowledge are not smooth. The integration and unification of customer knowledge, and application feedback, require enterprises to develop new marketing and incentive measures to attract and encourage customers to return to the store or introduce friends and family to receive services so that they can feel the progress and changes of the nail salon during the service. Currently, the T nail salon lacks corresponding marketing methods and fails to establish communication channels and groups between customers and employees, as well as between nail salons. As a result, there is no way to inform customers in a timely manner about updated service content and methods.

D. Insufficient Enterprise Management

From the above analysis, it can be seen that the current situation and problems of knowledge management in the T nail salon imply loopholes and deficiencies in enterprise management.

1) *Unclear internal rights and responsibilities*: The database is not updated in a timely manner and there are not many opportunities for practice. The reason for this is due to the lack of supervision and management by the store manager. The store manager focused mainly on serving his customers, neglecting the supervision and management of the store, the allocation of personnel, as well as the organization of various activities, and the confirmation of training effectiveness. As the boss, Mr. Song does not understand nail knowledge, he can only hand over all operational management matters in the store to the store manager. This complete delegation of

power has caused the store manager's rights to be excessively enlarged, but her obligations are not being supervised. Due to the infrequent visits of the boss, the employees are unable to communicate with him regularly, resulting in the inability to promptly implement new ideas and techniques that arise in the actual operation.

2) *Not-in-place incentive measures*: The T nail salon lacks a salary and benefits system, as well as an employee development plan. The apprenticeship teaching system has increased the workload of senior nail technicians, resulting in a waste of time and energy. Currently, the salon compensates senior nail technicians in the form of overtime pay, which is too simple and vague, lacking unified assessment content, incentive measures, and a welfare system. Although the salon provides training at a lower price than the market, junior nail technicians and apprentices believe that the company lacks an overall talent development plan. They are uncertain about their future prospects, and apprentices often go on to work for other nail companies after the end of their training period. This high turnover rate also leads to the loss of tacit knowledge among employees.

3) *Incomplete assessment mechanism*: The T nail salon has not integrated knowledge organization, knowledge development, and knowledge extraction into the knowledge management system, nor has it made the duration, content, and effectiveness of apprenticeship training an important criterion for assessing the work of nail technicians. There is a lack of assessment for store managers in terms of customer satisfaction, company profits, and management ability and effectiveness. For most employees, work is work, and knowledge management is knowledge management. Most employees are forced by the organization to passively seek and upload some knowledge to the knowledge base after the fact, just to get by.

4) *Insignificant customer management*: The T nail salon lacks training in daily communication skills, communication methods, and content for employees and customers. Employees only rely on simple surveys to gather customer knowledge, without paying attention to understanding, analyzing, and extracting customer tone, emotions, and attitudes during the service process. Additionally, there is no follow-up tracking and improvement of customer ratings and social media comments after the service is completed. Some nail technicians, due to long-term fixed service to a certain customer, have a strong connection with the customer and consider themselves to be friends with the customer. In the process of communication and interaction, they lack boundaries and ignore the customer's opinions and suggestions, showing a lack of proactive service awareness. The customer cannot feel the respect and care from the company. Some ideas and suggestions proposed by the customer have not been taken seriously by the T nail salon. Sometimes the store manager and nail technicians will regard these suggestions, complaints, and dissatisfaction as malicious competition among peers or nitpicking by customers.

V. CONSTRUCTION OF THE T NAIL SALON KNOWLEDGE MANAGEMENT SYSTEM BASED ON SECI MODEL

Based on several issues highlighted by the knowledge management of the T nail salon, we attempted to help it further optimize the knowledge management process through

SECI model, promote knowledge acquisition, storage, sharing, and application, and build personal, team, and organizational knowledge systems. We aimed to effectively establish the cognition of knowledge management, gradually form the thinking and framework of knowledge management, and ultimately achieve a comprehensive effect of improving the quality of enterprise services and competitiveness.

A. Purpose of Knowledge Management

The construction of the knowledge management system should fully consider the background of T nail salon as a small and medium-sized service company. Based on the problems existing in the salon and the current development bottlenecks, the purpose of establishing knowledge management in the salon is to optimize service processes, improve decision quality, enhance employee capabilities, and promote knowledge innovation. This process enables enterprises and customers to have a clearer and more precise positioning of services and management models and take corresponding rectification measures.

B. Principles of Implementing Knowledge Management in SMEs

1) Simple and practical, closely integrated with business:

There are many methods and tools for knowledge management. The T nail salon needs to remember that all knowledge management is for business service. Software tools should not be complicated, but simple and practical. As the quantity of knowledge stored increases, attention should also be paid to improving its quality. In this process, staff need to learn to subtract, not complicate simple problems, the means of promotion should not be too cumbersome, just appropriate and precise, avoid drastic changes, and blindly overturn existing management. The big goal needs to be broken down into several smaller tasks to make it easier for everyone to understand, facilitate operation, and then be able to successfully complete it in stages.

2) Implement policies based on individuals and promote them in a hierarchical manner: If SMEs want to promote knowledge management, the key depends on the attitude and determination of the boss and professional managers, as well as the effective participation of all employees. As long as bosses and professional managers take the lead and set an example, from top to bottom, firmly and unwaveringly integrating the concept of knowledge management into the entire business service, especially for SMEs, the implementation of knowledge management is easier to achieve success than for large enterprises. For nail technicians, it is not required for them to deliberately correspond to corresponding concepts during the service process. It only requires team members to subconsciously accept the inherent requirements of knowledge management in their daily learning and work and to try and experience the progress brought by this knowledge. They should strive to create a proactive learning atmosphere and a good atmosphere for learning knowledge management within the team. In this process, it is especially important to grasp the principle of gradual progress. We cannot expect all employees to mechanically implement this concept in a general way, otherwise it will bring about the opposite result. On the one hand, it will increase the workload of the manicurists, and

on the other hand, it will also cause their resentment and resistance, and the actual effect will be greatly discounted.

3) People-oriented, focusing on individual growth and capability enhancement: Establishing a knowledge management system in a company is not about simply squeezing individual knowledge out, nor is it blindly assigning tasks and targets to employees. Instead, the focus should be on how to enhance individual growth and capability improvement. Only by guiding and assisting employees to develop good knowledge management habits can organizational knowledge management be implemented. When individual knowledge management is done well and abilities are improved, organizational knowledge management will naturally fall into place.

C. Implementation Step and Stage Objective

In order to ensure the implementation effect of the plan, all work should be promoted according to the PDCA principle of the plan, do, check, and act, and the implementation step and stage objective are as follows (Chart 1 & Chart 2):

Chart 1: Implementation step

Plan	<ul style="list-style-type: none"> Confirm the importance of knowledge management with the boss and store manager, accept and learn related knowledge Put forward the design concept, optimization plan and phased goals, listen to the suggestions of employees, and improve the implementation plan
Do	<ul style="list-style-type: none"> All members held mobilization meetings to publicize and explain the rectification plan and incentive measures, mobilize the enthusiasm of employees, and enable employees to initially establish the awareness and concept of knowledge management Confirm the main body and responsibility requirements of the program implementation, and divide the process and personnel Ensure the smooth implementation and steady progress of all measures
Check	<ul style="list-style-type: none"> Verify the effectiveness of the actions taken, and compare the completion with the target value to see if the intended goal has been achieved If the expected effect does not occur, it is necessary to confirm whether the plan was strictly implemented, what problems occurred in the implementation, and find out the cause of the failure
Act	<ul style="list-style-type: none"> Measures that have been proven to be effective should be standardized and perfected, and unified working standards should be formulated for future implementation and promotion For the problems that have not been solved, lessons learned should be summarized and rectified in a timely manner

Chart 2: Stage objective

	27 days	36 days	18 days	10 days	person in charge
Select a topic					the boss
Make a plan					
Status grasping	30%				
Make a target	P				
Analysis					
Establish measures					the shop manager
Take action and review		40% D			
Confirm effects			20%		the boss
Standardization			C		
Improvement				10% A	the boss - shop manager

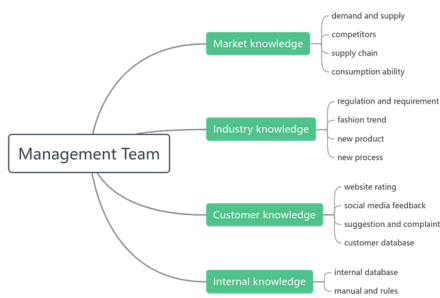
D. Optimization Solution for T Nail Salon Knowledge Management

In response to the knowledge management optimization plan proposed by the T nail salon, we should follow the principles of simplicity, ease of operation, and minimize cumbersome processes. We should aim to maximize the utility of knowledge management with minimal cost, without affecting the normal operation of the nail salon or increasing the workload of employees.

1) *Adjust Personnel Structure and Clarify the Functions of Each Department:* Adjust the personnel structure of the T nail salon to a management team composed of the boss and store managers; a technical team formed by apprenticeship groups (a total of three groups), managed by store managers.

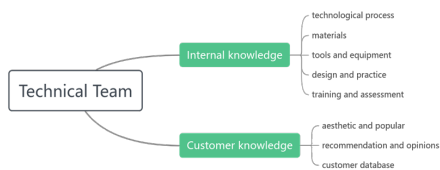
a) *Management team:* The role of the store manager is being repositioned to be solely responsible for internal management and not serving customers. The store manager’s work will be directly supervised and managed by the boss. The function of this team is to timely and accurately identify and record market changes, including market competitors, upstream and downstream supply chains, popular trends, as well as evaluations and feedback from social media on nail salons; collect new regulations and standards in the market industry, make judgments, and guard against unknown risks; integrate customer knowledge and internal staff knowledge, write and update databases and operation manuals; organize various trainings and activities to continuously improve skill levels and service quality (Chart 3).

Chart 3: Management team’s duties



b) *Technical team:* Each apprentice group is led by a senior nail technician who imparts nail knowledge to the apprentices, including materials, products, environmental protection, cleaning requirements, tool usage, design abilities, and technical improvement. They collect and extract customer needs and feedback, and organize regular internal training and assessments to evaluate the results of the training (Chart 4).

Chart 4: Technical team’s duties



Management team and technical team, are both interdependent and interact with each other. The management team’s

accurate and precise support to the technical team provides a solid foundation for the expansion of the technical team’s business and skill improvement. Meanwhile, the new ideas and skills generated by the technical team’s enhanced knowledge and innovation ability will also actively drive the management team to set targeted goals and directions for the next stage.

2) *Strengthen knowledge exchange and sharing, promote knowledge socialization:*

a) *Optimize the effectiveness of apprenticeship training:* The T nail salon needs to reassign apprenticeship group members to achieve differentiation in the background of the group members, avoid the limitation of assimilation of thinking, encourage collision of ideas and communication between different members, and then spark new inspiration, concepts, and ideas, creating new knowledge. Specifically includes age, project experience, professional background, cultural environment, nationality, personality, etc. The T nail salon should continue to monitor the progress and effectiveness of the apprenticeship training, and make timely adjustments to error correction strategies and guidance methods through multidimensional and multilevel evaluation methods to prevent dysfunctional mentorship [31][32][33][34] and mental dead-lock. If there is unpleasantness among team members due to personality or hobbies, resulting in poor cooperation, negative emotions, pressure, professional burnout, etc., it is necessary to analyze the reasons in a timely manner, reassign members or adjust the group structure, and improve training methods in a timely manner. Meanwhile, the management team should fully cooperate with each apprenticeship group to carry out regular practical activities, provide them with comprehensive support such as funds and technology, and regularly track and improve the training effectiveness.

b) *Establish incentive mechanisms:* The T nail salon should start from the actual situation of employees, and strive to achieve an organic combination of position promotion, economic rewards, and respect in the incentive mechanism, so as to further improve the enthusiasm of employees to share tacit knowledge. In addition to providing economic compensation for the master, and improving welfare benefits, such as issuing training allowances, providing transportation or food subsidies, the company should also periodically evaluate the skills of the nail technicians, promptly awarding them with honorary certifications, enhancing their sense of corporate honor and mission, and increasing their influence and reputation among peers, better stimulating their enthusiasm to share their knowledge with the team. The nail salon should also care about the long-term career development and planning of its employees, improve their sense of belonging and happiness at work, and establish a frank and two-way trust between the company and its employees. It can refer to the “lifetime employment system” of Japanese companies. The nail salon ensures that senior nail technicians who meet the standards receive better benefits and promises not to dismiss them arbitrarily, so that outstanding employees, once accepted by the company, firmly believe that they are an important part of the company and can therefore focus more on sharing their knowledge and skills.

c) *Create an open and relaxed communication mode:* This form of communication can establish positive interpersonal interaction, enhance mutual trust, create an inclusive and open corporate communication culture, and promote the

socialization of knowledge. As a small service-oriented company, the personnel composition of the T nail salon is relatively single, and the organizational structure is relatively flat. The boss, store manager, and employees can use tea breaks and lunchtime to increase communication frequency. They can also regularly hold some collective activities to help new employees quickly integrate into the organization and maintain friendly relationships between new and old employees.

For customers, the T nail salon should take various effective measures to actively establish close relationships with customers, which is the best way to attract and retain customers. Traditional customer incentive methods are manifested in the form of bonuses, points, gifts, etc. but basically, all nail salons adopt such methods, which are no longer attractive to customers. The nail salon should consciously cultivate a warm and intimate family-like relationship between employees and customers. During the service process, always pay attention to the customer's emotional feelings and detailed requirements, including lighting, temperature, and other needs, to make the customer feel relaxed and comfortable. To establish a set of standardized, simplified, and practical service processes, conveying a professional, enthusiastic, and proactive corporate image and a customer-centric value concept to customers, while also adopting irregular telephone follow-ups, event invitations, etc. to timely understand customers' new needs and make adjustments and changes as appropriate, so that customers can feel that the T nail salon is not just a place that simply provides services, but also a "haven" and "recharging station" that brings warmth and care like family, allowing customers to relax, eliminate fatigue, and forget worries.

3) Improve knowledge conversion ability and promote knowledge externalization:

a) Sound performance management: The T nail salon needs to use forms such as weekly logs, process evaluations, and simulated exams to assess learning outcomes based on unified apprentice training standards, processes, and assessment systems. All nail technicians are required to write a learning journal every week, using text or images, to summarize their learning achievements in a timely manner and provide at least one to two suggestions, which will be scored and confirmed by the management team and included as part of the performance appraisal. The store manager submits a monthly work report to the president, informing them about the company's operating conditions, training achievements, and future development suggestions. The boss also needs to establish a bonus system directly linked to performance, so that the store manager's income is closely related to their work achievements. It is also necessary to consider long-term measures such as equity and profit sharing, in order to effectively stimulate the store manager's enthusiasm and creativity.

b) Increase the frequency and efficiency of knowledge exchange: The management team must regularly organize special seminars, invite experts to provide on-site guidance, and organize external learning activities for employees, providing a platform for exchanging service experience and skills among employees. The content and form of these activities should be diverse, with the aim of achieving two-way communication between participants rather than passive input. For example, question and answer format, heuristic, scenario practice, gamified training, etc. Through these activities, the tacit

knowledge and tricks of technical experts and individuals are extracted and refined, and turned into actionable explicit cases or manuals, further facilitating employees to examine their own understanding from different perspectives, excavating the latent tacit knowledge in their minds, and then organizing it into explicit written materials with a certain logic, promoting the transformation of shallow and vague tacit knowledge into deep and clear explicit knowledge. The management team needs to summarize and extract these scattered experiences, form written language, pictures, or videos for retention, for everyone to learn, and ensure the circulation and transfer of knowledge among employees, teams, and within the organization. These activities can also invite employees who have already left the company so that on the one hand, they can tap into and record their inherent tacit knowledge and experience skills, and on the other hand, they can also help the T nail salon better identify and solve potential problems.

c) Analyze and review cases: The management team and the leaders of each group should regularly compare and analyze similar past projects, carefully summarize successful cases, and extract useful thinking and methods from them. To analyze the reasons for failure, it is necessary to conduct a retrospective and scenario reproduction, summarize the lessons learned, and provide references for the company to avoid similar mistakes in the future. This will enable the company to develop targeted measures to recover losses and better regulate employee behavior.

d) Use knowledge base software: Using knowledge base software as the central hub for company information, including personnel policies, project management, meeting records, operation manuals, etc. software allows for editing and management of documents anytime and anywhere. It helps to build knowledge maps and knowledge communities, making it convenient for employees to intelligently search and quickly find the information they need, thereby improving work efficiency. Additionally, it allows for detailed classification and recording of customer data, such as customer age, store visit frequency, personality, special requirements, purchase history, social media reviews, etc. This information can be recorded with tags, and various parameters can be updated, cleaned, and integrated in a timely manner. This helps businesses to more accurately build customer profiles, and pinpoint customer preferences, behavior patterns, and customer resources, in order to provide personalized services to customers. T Nail should encourage all nail technicians to contribute their own opinions and ideas to the knowledge base, including company processes, environment, skills, management measures, etc., without being bound by details and forms. For useful opinions and ideas, corresponding rewards should be given. Besides, nail technicians should also be encouraged to share their professional knowledge and project experience with the entire team by writing internal technical blogs. Depending on the size and business needs of the nail salon, the knowledge base of the T nail salon does not need to be too complicated, simple, and practical, with low fees. For example, HubSpot CRM, PingCode, and Nuclino are all good choices.

4) Improve knowledge integration and promote knowledge combination:

a) Carry out knowledge organization work and update in real-time: The management team needs to establish a

high-quality, data-rich, fast-updating, and easy-to-use operation manual. In this process, special attention should be paid to the cultivation of the management team's abilities. The explicit written records such as drafts, initial concepts, and project notes formed by each group are collected diligently. On this basis, a detailed analysis of these written records is conducted to determine if there are any contradictions and biases and if they are established in a certain context. Drafts that are repetitive, incomplete, of low quality, and documents without reference value are deleted, as well as outdated technology and obsolete knowledge. It is important to timely integrate the retained knowledge and documents and to conduct comprehensive discussions on the problems, countermeasures, logical thinking, framework planning, and project results during the project process. The content of the documents should be classified and extracted to establish a hierarchical database, ultimately forming a standardized manual that includes template paradigms, reference guides, and skill summaries that are updated in real-time. This will facilitate all employees to review and evaluate their work effectively and to handle sudden issues more targeted.

b) Cooperate with competitors and substitutes for win-win: The two major threats to businesses in development are rival competitors and substitutes. Employees of the T nail salon must use a respectful and appreciative perspective to compare themselves horizontally with other nail technicians in the market and identify their own shortcomings. Companies must also actively communicate with their competitors in an open and inclusive manner, share resources, complement each others' strengths, collaborate, and seek improvement through competition and development through cooperation. For alternatives, we need to change our mindset and try to make adjustments in combination, so as to provide broader ideas and space for the future development of the T nail salon.

c) Achieve co-creation of value between the company and customers: The T nail salon needs to provide differentiated services to different customers. By segmenting customers, standard services are provided to ordinary customers, while higher-level services are provided to key customers, such as free birthday month, holiday gifts, double points, free access to new products, new technologies, and free transportation. To increase customer interaction and engagement, the salon can organize a nail art salon photo contest. They can also invite customers to participate in educational video collaborations and reward them with points and random free services for participating in these activities. Through these activities, customers can experience the charm of the brand in a three-dimensional and diversified way, forming a good atmosphere of consumer-driven communication and sharing with each other. The purpose of these activities is to establish a family-like intimate relationship with customers, thereby continuously enhancing customer stickiness and loyalty. The T nail salon should establish exclusive customer groups for similar clients, such as creating a nail salon housewives' group. In the group, housewives can freely express themselves and share their parenting experiences and cooking skills. The salon can also hold various activities for these similar customers, supplemented by different themes, such as bride theme, vacation theme, workplace theme, etc. Based on these themes, multiple packages are offered for customers to choose from. By bringing together these similar customers for face-

to-face communication and interaction, it can help create a large amount of high-quality tacit and explicit knowledge, and apply this knowledge timely and accurately to the operation and service of the nail salon. As Mr. Matsushita Konosuke, the founder of Panasonic, said, only by establishing long-term and stable cooperative relationships with customers can we achieve mutual prosperity between the company and customers.

d) Introducing AI into the nail art process brings a different experience to customers: Currently, AI technology has been applied to various industries, and the T nail salon can try to use AI technology to achieve service upgrades. By utilizing big data analysis, consumers can have more convenient and efficient access to global trends and personalized nail art designs, providing a diverse range of design elements and style choices. By using AI algorithms, intelligent recognition and analysis of customer information can be achieved, allowing for color, style, and occasion matching from a more scientific perspective. Through virtual reality (VR) and augmented reality (AR) technology, consumers can virtually try out more colors and styles, and have a more intuitive experience of color testing and previewing effects, solving the problem of nail damage and time wastage caused by repeated application. The introduction of AI intelligent nail art machines and 3D printing technology enables the completion of a single finger painting in 40 seconds, with mold designs that better fit the customer's skin and bone structure, and the ability to accurately identify the comprehensive effects of different nail surface contours, making the nail art process simple, fast, and intelligent. The introduction of an AI translation system helps the T nail salon achieve real-time voice translation, further enhancing the accuracy and timeliness of communication.

5) Deepen knowledge application and promote knowledge internalization:

a) Organize employee practical activities: After integrating and extracting explicit knowledge, a unified employee operating procedure is formed, and it is necessary to ensure a practical effect on employees in the future. At this stage, the store manager should develop detailed plans, plan and implement relevant activities, form a systematic learning practice, and make it easy for employees to participate in corresponding activities according to their own interests and time. The specialized nail technician or external teacher serves as the lecturer and regularly holds specialized training sessions based on different topics. For example: painted topics, gradient topics, etc. The management team should encourage employees to express their feelings and thoughts and to think divergently. Nail technicians have new ideas and concepts, the company should promptly encourage and turn these ideas into physical displays such as display stands to showcase, and promote them on the appointment website. Nail technicians can choose to have this style exclusively for themselves or share it within the salon. If shared within the salon, every time the design is chosen by a customer, regardless of which nail technician performed the service, the company will provide a certain percentage of reward to better stimulate the creativity and imagination of the nail technicians.

b) Form a positive interaction between customers and businesses: Effective communication between customers and businesses is essential for customer knowledge management in this process, and it must be supplemented with effective

marketing methods and techniques. the T nail salon, while experiencing new products, new technologies, and new services, should guide customers to compare and think, and at the same time, comprehensively record customer feedback and make timely improvements and adjustments. It is important to note that customer feedback should be analyzed scientifically and not rushed into making blind changes. The changes in the operation and management of nail salons may require customers to have a long period of experience before they can generate their own ideas and suggestions. More time should be given for observation and adjustment of such decision-making processes. In addition, the generation of customer knowledge is a continuous cycle of innovation that needs to be constantly repeated, which particularly requires the exploration and establishment of a long-term positive interaction mechanism between the enterprise and the customer.

VI. RESULTS

The construction of the knowledge management system for the T nail salon is a process of mutual knowledge transformation, which requires a long time to verify its effectiveness. the T nail salon is currently trying to use the methods and means mentioned above to gradually reform the operation and management of the store. After more than two months of practice, some initial results have been achieved.

1) *The customer satisfaction survey*: questionnaire shows a satisfaction rate of 86.3%, with an increase of nearly 20%. Moreover, the customer retention rate has significantly improved, and the sense of participation has significantly increased. Over 22% of customers actively participate in the nail design and store brand image enhancement program. Currently, the salon has increased its rating on Japan's largest reservation website, Hot Pepper, from 4.63 to 4.89 (the full mark is 5).

"I have been doing manicures for almost 5 years, and have been to many nail salons, but the T nail salon gave me a different feeling. Communication with the staff of the T nail salon is very smooth and comfortable. They regularly remind me to take care of my nails and provide me with exclusive customization in advance according to my activities. Their cultural and creative products are also particularly useful. I attended two tea parties organized by them, which were particularly relaxing and allowed me to meet many like-minded good friends. The T nail salon has become more than just a store to me." (Customer: Airi)

2) *The anonymous satisfaction survey*: distributed by the chief to all nail technicians in the salon shows a significant increase in employee satisfaction. Employees generally believe that salon management cares about their careers and provides them with a lot of help in their professional development. The effectiveness of employee training has improved qualitatively, with a noticeable increase in initiative and enthusiasm for learning. A level 2 nail technician has passed the level 1 qualification exam, and two level 3 nail technicians have passed the level 2 nail technician qualification exam. The skill level has significantly improved. Among the employees who previously resigned, there was an employee who expressed her desire and plan to come back to work to the boss.

"I feel it's amazing, unconsciously, I have shared my experience, and our communication has increased. We have sparked and collided with many new ideas. Later, the store manager told me that this was because they used knowledge management methods. I felt very incredible and thought it was very magical." (Senior nail technician: Tina)

"I was chatting with my former colleagues and discovered that the T nail salon has recently undergone some changes that are truly delightful. The reason I resigned was because T Nail Art's plan for my future career development was unclear, and I was constantly worried about being replaced. I heard that now the T nail salon has adopted a lifetime employment system for qualified employees, and has also provided many allowances and subsidies to improve welfare benefits. There is increased communication and cooperation among nail technicians, and the atmosphere is particularly harmonious. Everyone's enthusiasm for work is particularly high. Now, I really want to go back to the T nail salon to continue working, hoping to have this opportunity." (Former nail technician: Amy)

3) *Compared to the past*: the turnover of the nail salon has greatly increased. The daily growth rate of customers visiting the store is nearly 47%, and the average daily number of customers visiting the store has increased from 15 to 22. The turnover of the nail salon has increased by nearly 40

"I regret not using the theory and methods of knowledge management earlier. Through practice, it has been proven that knowledge management and business management are not conflicting, and the two can be well combined and mutually promote each other, which is of great help to the enterprise. Moreover, the advanced electronic management methods and systems, although causing a certain increase in costs, the benefits they bring far outweigh these costs. As the chief of the store, I should have a long-term perspective and vision. I should actively learn this knowledge so that I can better develop my business." (the boss: Mr. Song)

VII. DISCUSSION

The paper addresses the challenges faced by T Nail Salon, specifically focusing on knowledge sharing, externalization, and the implementation of the SECI model. It emphasizes that employees are often reluctant to share tacit knowledge due to competitive dynamics and the fear of losing their competitive advantage. To overcome these barriers, it is crucial to implement strategies that foster trust, establish open communication channels, and cultivate a more collaborative environment. Moreover, the high turnover rate at T Nail Salon contributes to the loss of tacit knowledge. Therefore, strategies such as comprehensive onboarding processes and knowledge retention systems should be considered to mitigate this issue.

Additionally, the paper examines the effectiveness of the SECI model in small service-oriented businesses (SMEs). SMEs can simplify the application of the SECI model by utilizing cost-effective technological tools, such as knowledge-sharing apps or collaborative platforms.

Furthermore, providing hands-on training for employees can enhance their understanding and application of the model. The paper also explores the challenges associated with transforming tacit knowledge into explicit knowledge, particularly given

that employees possess varying levels of technical expertise. While the paper highlights the potential benefits of knowledge management, it does not delve into its measurable impacts on business performance.

An essential area of growth lies in integrating technology into the knowledge management. Currently, the salon utilizes limited customer management tools; however, by exploring affordable and simple digital solutions such as HubSpot CRM or Google Workspace, the salon can implement practical and cost-effective systems suitable for SMEs. Additionally, examining the potential of AI and machine learning in knowledge management could offer a future-focused approach, enabling the salon to enhance its service offerings and customer relationships. Furthermore, adopting a more long-term strategic outlook would strengthen the paper's analysis. Knowledge management should be seen as a continuously evolving process that requires regular adaptation and feedback. To this end, the salon should periodically evaluate the effectiveness of its knowledge management system and make necessary adjustments in response to shifting business needs, technological advancements, or changes in market conditions. Moreover, expanding knowledge management beyond the internal team and involving external stakeholders could open avenues for innovative ideas and strategic partnerships. By incorporating these considerations, the paper would provide a more comprehensive analysis of the challenges small businesses face, such as T Nail Salon, and offer actionable recommendations for enhancing knowledge management, ultimately driving business performance, innovation, and long-term success.

VIII. CONCLUSION

Although the T nail salon has a smaller scale, its business model and scope belong to typical small and medium-sized service-oriented enterprises. This study analyzes the current situation and development bottlenecks of small and medium-sized service industry enterprises using the T nail salon as an example. It emphasizes the importance of knowledge management and proposes the need to establish a knowledge system within the company that combines both humanistic and technological aspects. This system should facilitate the acquisition, storage, integration, sharing, and innovation of knowledge, enabling the transformation of tacit knowledge into explicit knowledge and the combination of internal knowledge with external knowledge. Ultimately, this will lead to product upgrades and improved efficiency. From the practice of using SECI model in the T nail salon, we can also conclude that small and medium-sized service-oriented enterprises can use appropriate means and less cost to achieve effective knowledge conversion among individuals, teams, organizations, and customers, and achieve orderly knowledge management. The isolated and scattered concepts and elements in the knowledge management system can be integrated organically and run through all the processes of enterprise operation and management.

It is certain that learning the theory and methods of knowledge management is not about making management and employees all experts in knowledge management, but starting from the perspective of knowledge management to help enterprises systematically grasp the problems existing in operation and development, rather than relying solely on general

financial statements and current situation analysis. It should be emphasized that the construction of a knowledge management system is a long-term process. It cannot be expected to be achieved in a short period of time. It requires enterprises to shift from passive to active, from intuitive to rational, from simple to complex, and to persistently improve and perfect the level of knowledge management in order to continuously enhance the economic benefits and core competitiveness of the enterprise.

IX. LIMITATIONS

Although this study has achieved certain research results, it has proposed a solution to T Company's knowledge management problem and explained the implementation methods and effects. However, there are still many shortcomings in this study. For example, due to insufficient interview experience, there may be subjective bias in the interview content, and the small scale of the T nail salon may result in a small scope of investigation and insufficient quantitative analysis. For the above shortcomings, it is hoped to continuously improve in future long-term observation and practice and also that future research can make up for the deficiencies in this study.

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CONFLICTS OF INTERESTS

Authors do not have any conflicts.

DATA AVAILABILITY STATEMENT

No datasets were generated or analyzed during the current study.

CODE AVAILABILITY

Not applicable.

AUTHORS' CONTRIBUTIONS

Chen Chang, Sawaguchi Manabu, is responsible for designing the framework, analyzing the performance, validating the results, and writing the article. Yasuaki Mori, is responsible for collecting the information required for the framework, provision of software, critical review, and administering the process.

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