

Research on Patent Knowledge Management Mechanism and Innovation Performance of Research Universities in Taiwan

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Abstract: The main objective of this study was to identify and interpret the role of the patent team members' intellectual property claims on knowledge acquisition and innovation performance in the context of today's knowledge-based economy and dramatic ongoing changes (technological and otherwise) in Taiwan, and to survey the Research and Development departments of various universities in Taiwan. To effectively understand and establish a model of patent team knowledge management (KM) and innovation. This study will adopt the qualitative research multiple case study method, with patent team members of universities and colleges in Taiwan as subjects. This study further divides the composition of patent teams into four categories, including national universities, national universities of science and technology, private universities and private universities of science and technology. Using a concurrent combination of quantitative and qualitative approaches, a pragmatist research philosophy was chosen for this research to obtain in-depth analysis and provide comprehensive new insights into the key incentives promoting innovative knowledge-sharing behaviour among university academic staff in Taiwan. The predictive results of this study will provide important theoretical and practical insights into the patent knowledge management strategy and innovation performance of Taiwan universities and colleges, as well as valuable suggestions for patent knowledge managers in the context of Taiwan society.

Keywords: Knowledge Ownership, Knowledge Management, Innovative Performance, Pragmatist Research Philosophy

1. Introduction

The academic community's attention to knowledge sharing stems from the expansion of knowledge management research in the late 20th century when the characteristics of the knowledge economy were obvious. Karahanna (2013) detailed the design scheme of the organisational system suitable for knowledge sharing. Since then, more and more scholars have studied knowledge sharing from different perspectives, and the research field has been expanding from enterprises to social organizations such as government and education. The research on knowledge sharing has gradually become the focus of knowledge management. As for the concept of knowledge sharing is generally regarded as a process of knowledge transfer, interaction and communication, but different researchers have different understanding emphases, and some emphasize the sharing of knowledge between knowledge holders and demanders (Xie et al., 2016). Some emphasize the knowledge exchange and learning process among members of an organization (Senge, 1997), and some emphasize the process of one-party transferring knowledge to the other. The subject scope of knowledge sharing can be both internal and cross-organizational (Lee et al., 2016). Regarding the process of knowledge sharing, Nonaka et al. (2000) put forward the SECI model based on the four parts of knowledge socialisation, externalisation, combination and internalisation based on summarizing knowledge management, knowledge sharing and innovation. Szulanski (2000) proposed a five-stage model from the knowledge transfer perspective, including acquisition, communication, application, reception and assimilation. As for the factors that influence knowledge sharing, many scholars at home and abroad have studied them from different perspectives. Simmoni (1999), Coleman and Casselman (2016) argue that knowledge ambiguity affects knowledge sharing due to the reticence, complexity and specificity of knowledge. Regarding organisational characteristics, the salary system, incentive system, organisational atmosphere and organisational culture impact knowledge sharing (Serenko & Bontis, 2016). Individual characteristics, individual personality, self-realisation, sense of self-worth embodiment, attitude, organisational identity, and status competition motivation impact knowledge sharing (Kim, et al., 2019).

The scope of research in knowledge management at home and abroad is getting broader and wider, and remarkable achievements have been made. Various discussions and empirical studies have different concerns and perspectives, as well as different theoretical frameworks and research questions. However, judging from the current research perspective and scope, the current research on patent knowledge ownership still has considerable room for expansion. The comprehensive interdisciplinary perspective of knowledge sharing has yet to be expanded, and the comprehensive influencing factors of patent knowledge ownership have yet to be analysed. More comprehensive and specific. Research on universities as knowledge-intensive organisations

needs to be strengthened from the perspective of knowledge ownership of patents. In particular, most domestic research on the knowledge management of university teachers or scholars mainly conducts theoretical discussions, and research on the knowledge ownership mechanism of university teachers' patents is insufficient, especially since there is a lack of research on issues related to patent ownership among cross-regional university teachers, which points out the space and direction for this research.

2. Literature Review

2.1 Research on Knowledge Sharing Among University Academics

Learning and practising through teaching, practice and research, and enhancing innovation through collaboration with businesses and institutions, universities are generally viewed as knowledge-intensive and knowledge-creative entities that play a vital role in the dissemination and sharing of knowledge (Patel & Ragsdell, 2011; Fullwood et al., 2013; Ramayah et al., 2014). Therefore, the research on knowledge sharing of university teachers is an important part of knowledge sharing research. Regarding the importance of knowledge sharing among university teachers, scholars communicate with each other and share knowledge, and effective knowledge management is considered to be a key factor in the success of higher education (Fullwood et al., 2013; Fullwood & Rowley, 2017), this factor is particularly significant in research universities (Goddard, 1998). Tan (2015) believes that knowledge sharing and research collaboration among scholars are fertile soil for knowledge innovation and foster new knowledge for the academic community. Therefore, encouraging important behaviours, such as frequent knowledge sharing, cannot be ignored in academia. For example, in the relevant programs of government departments (such as the special research plan of the Ministry of Science and Technology, the teaching practice plan of the Ministry of Education, etc.), most teachers in research universities choose to cooperate with others to provide each other with the research knowledge and work experience accumulated over the years, so as to complete academic work jointly. Therefore, academic personnel working in universities, especially research universities, through the sharing of knowledge among each other, carry out collaborative research, thereby creating new theories and ideas and establishing new research principles. Unfortunately, many institutions, including research universities, do not seem to realize the importance of knowledge management, and the implementation of knowledge management programs within institutions is still hampered by a lack of enthusiasm and initiative (Tan, 2015). Therefore, universities should focus on increasing the importance of knowledge management to understand the preparation of universities to maintain a knowledge-based society, including the sharing of quality resources, expertise, research work and collaboration, so as to achieve good development (Jandaghi et al., 2014). In the past, influential factors and ways of promoting knowledge sharing among university teachers have attracted much attention, such as the willingness to share knowledge. Osterloh and Frey (2000) pointed out that knowledge-sharing behaviour among scholars is closely related to the motivation behind it. Donate and Canales (2012) believe that the market mechanism will not improve the enthusiasm of university scholars for knowledge sharing. On the contrary, these scholars will be encouraged to retain and hide their own knowledge or research results. Therefore, intrinsic motivation is the key factor affecting the transfer and sharing of implicit knowledge by university scholars, while external motivation has no expected impact on knowledge-sharing behaviours of organizational members (Fullwood et al., 2013; Fullwood & Rowley, 2017). Many researchers have also paid special attention to social network factors. Relevant studies believe that teachers' knowledge-sharing behaviour is affected by job titles, scientific research collaboration networks, friendship relationship networks, team affiliations, etc.

2.2 Research on Patent Knowledge Management and Knowledge Ownership of Organisational Members

According to the World Intellectual Property Organization (WIPO), intellectual property can be primarily divided into the following types: patents, trademarks, trade secrets, geographical indications, and industrial designs (WIPO, 2021). Concerning the importance of intellectual property knowledge management, for scholars, how to effectively manage and share knowledge, practice, and protect intellectual property is a topic worth attention. However, constrained by various factors such as school encouragement, awareness of intellectual property knowledge, innovation and novelty of research and development outcomes, the presence of technology transfer centers, university attributes, etc., many institutions, including research universities, do not seem to realize the importance of intellectual property knowledge management, leading to limitations in the implementation of intellectual property knowledge management programs (AR et al., 2021). Effective patent knowledge management is even more crucial for scholars in research universities within intellectual property. Research

universities need to enhance scholars' emphasis on patent knowledge management. Besides understanding the academic contributions of scholars in science and technology to the socio-economic aspects, sharing high-quality resources, expertise, research outcomes, and industrial collaboration can further disseminate laboratory research results through incubation centres and research institutions. In the realm of patent knowledge management, many scholars analyse from a technical perspective, such as countries, inventors, applicants, citations, etc., to gauge the extent of knowledge diffusion (Kayal & Waters, 1999; Sun et al., 2008; Hall & Helmers, 2013; Song et al., 2018). Some scholars also use social network analysis as a substitute for patent citation analysis to understand the diffusion of knowledge across different institutions and countries (Hsieh & Wang, 2009) and utilize multidimensional network analysis of patents to evaluate the impact of network structure and government funding on knowledge diffusion networks (Jiang et al., 2013). In studies on organizational and individual patent ownership, scholars have examined factors at the organizational, individual, and patent levels and their respective relationships with academic patents, indicating that for academic inventions, the value of the patent itself appears unrelated to choices in patent ownership (e.g., whether a university owns it) (van Burg et al., 2021). Furthermore, there is a positive correlation between the proactiveness of intellectual property ownership and the success of university-industry cooperation (UIC) projects when companies implement robust shared governance (Gretsch et al., 2020). In research on patent knowledge ownership, scholars suggest that companies can strategically disclose their inventions based on internal knowledge, demonstrating their ownership of knowledge (Dornelles, 2020).

3. The Overall Framework and Contextual Development of This Research

This research will utilise a concurrent combination of quantitative and qualitative approaches to obtain an in-depth analysis and provide comprehensive new insights into the key incentives promoting innovative knowledge-sharing behaviour among university academic staff in Taiwan. The predictive results of this study will provide important theoretical and practical insights into the patent knowledge management strategy and innovation performance of Taiwan universities and colleges, as well as valuable suggestions for patent knowledge managers in the context of Taiwan society.

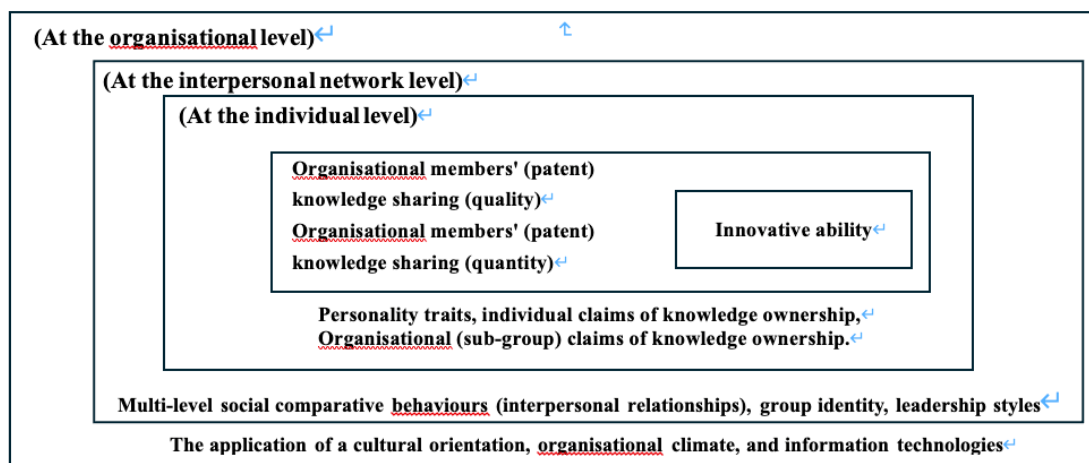


Figure 1: The application of the concept of organisational behavior (based on different historical backgrounds and social contexts) in this study.

This research aims to reveal the "black box" of the relationship between academic staff's traditional cultural orientation and their knowledge-sharing behaviour at the individual level. Research key points include: ① Introducing knowledge ownership to deduce the general mechanism of employee innovative behaviour; ② Analysing the potential "interaction" relationship between different traditional cultures and social network variables and different innovation motivations; ③ Using the "values → motivation → behavioural tendency model" (VMB) examines the mediating effect of different innovation motivations between different traditional cultural variables and employee innovative behaviour; ④ based on the first three points, construct a path model of the individual-level employee traditional cultural orientation on employee innovative behaviour, and Empirically test whether the impact of cultural orientation on innovative behaviour is mediated by different innovation motivations to produce a "masking effect".

Building upon the analysis results of the previous research content, this study delves deeper into the complex causal relationships among knowledge-sharing behaviour, interpersonal (relationship) networks, organizational culture, and organizational innovation capability of academic staff in Taiwan. This project is grounded in organizational behaviour research, integrating psychology (micro-level knowledge-sharing behaviour through ICTs), social psychology (mid-level), organizational systems, and anthropology (macro-level) to explore. Combining research breadth and depth, it explores a cross-layer collaborative mechanism model.

This research aims to explore whether the impact direction and magnitude of the innovative knowledge-sharing behaviour of academic staff at Taiwanese universities will be subject to the interference (moderation) of social comparison situational variables. Key research points include: ① Determining the heterogeneous effects of individual knowledge-sharing behaviours due to multi-level social comparison behaviours; ② Determining the heterogeneous effects of cultural social contexts in Taiwan's different regions (academic universities, industry-oriented universities) on knowledge-sharing behaviours in contrasting scenarios (high innovation demand atmosphere vs. low innovation demand atmosphere, cooperative atmosphere vs. autonomous atmosphere); ③ Determining the heterogeneous effects of culture on knowledge-sharing behaviours in contrasting scenarios (high-performance pressure vs. low-performance pressure).

4. Ongoing Research

This research aims to complete the transformation from theoretical research to practical application. Based on the previous theoretical research, this research will ultimately be based on Taiwan's unique cultural values and ideologies, focusing on the dual cultural subject of "individuals - other team members" and focusing on multiple groups of comparative innovation scenarios from the perspective of personal intrinsic motivation, Organisational workplace networks, organisational culture, organisational structure and other areas propose governance strategies that are suitable for promoting innovatively knowledge-sharing behaviour among university academic staffs in Taiwan. At the same time, this research will also provide theoretical references and a basis for decision-making for creating a cultural system and environment conducive to the national innovation-driven development strategy at the macro level. Finally, the full article containing the entire work is expected to be finished by August 2024.

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