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Development of audit system for intellectual property management excellence

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ABSTRACT

Intellectual property (IP) management has been widely accepted as an important topic to support the technological innovation. In order to effectively and efficiently implement IP management, it is more practical to firstly focus on the most important aspects which, in turn, provide immediate beneficial results to allow organizations to further implementing other aspects by allocating more resources. The authors propose an IP management excellence audit system that breaks down the complicated IP management practices into a list of enabling criteria and the IP management performance in various criteria can be measured in details. The enabling criteria are the critical success factors to good IP management system and practice. Analytic hierarchy process approach is used to determine the relative importance among the identified criteria in the IP management excellence audit system. The evidential reasoning approach is adopted to develop an expert assessment tool to carry out the audit of organizations' performance in IP management. Based on the audit results, organizations will know the strength and weakness of their current IP management practice and can allocate resources and efforts in priority area for improvement. The authors have validated the developed system and tool in HK–Guangdong (HK–GD) based manufacturing organizations with satisfactory outcome. The audit results are helpful to provide top management facts and information to develop action plans for improving IP management. This paper presents the proposed IP audit system and the industrial case study with the development of an expert assessment tool.

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1. Introduction

With the globalization of the world economy and the flourishing joint venture activities among manufacturing organizations, intellectual property (IP) management becomes significantly important for business enhancement. Given the importance of IP, manufacturing organizations need to enhance the IP management capability in order to overcome challenges arising from the global competition and upgrade themselves from original equipment manufacturing (OEM) to original design manufacturing (ODM) and original brand manufacturing (OBM). Our research aims to develop an IP management excellence audit system for the following justifications:

Firstly, resources are one of the limitations in implementation of IP management for manufacturing organizations. In order to effectively and efficiently implement IP management, it is more practical to firstly implement the most important factors which could provide immediate beneficial results to organizations. Then, organizations could evaluate the feasibility of further implementation of other factors by allocating more resources. The authors break down

the complicated concept of IP management system and practices into a list of enabling criteria such that the IP management performance can be measured in details, in terms of enabling criteria. The enabling criteria are the critical success factors to good IP management systems and practices. It will help organizations easier to understand the IP management issues so that they could pay attention to these critical factors in order to improve their IP management performance. Analytic hierarchy process (AHP) approach is employed to identify the relative importance of each criterion in the IP management in a particular environment. Organizations can concentrate resources and efforts according to priority for implementing the criteria so that the IP management performance is improved to obtain maximized and immediate benefits.

Secondly, organizations can employ the IP management excellence audit system as a tool to assess, measure and diagnose their IP management systems and practices. With the identified strengths, weakness and rooms for improvements, management could develop improvement strategies and action plans. Evidential reasoning (ER) approach is adopted to develop an assessment tool, a software tool to facilitate the audit of organizations' performance in IP management. Through the establishment of effective IP management systems and practices, the organizations can align their IP portfolio with business objectives and eventually maximize the potential value from their IP assets.

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The developed audit system and assessment tool have been validated in a pilot study in Hong Kong–Guangdong (HK–GD) based manufacturing organizations with satisfactory outcome. It is noteworthy that the Guangdong manufacturing region, located in the Southern China, is named as the factory of the world because of its first-rank outputs in toys, electrical appliances, watches, etc. “Hong Kong–Guangdong (HK–GD) based manufacturing organizations” are Hong Kong–invested industrial organizations in the Guangdong Province of China, with manufacturing activities based in Hong Kong and Guangdong. The case study result indicates that the IP audit could provide organizations the strength, weakness and rooms for improvement in their current IP management systems and practices. The audit results are helpful to provide top management facts and information to develop action plans for improving IP management. It functions as the first step of a continuous approach to improve the IP management in organizations, which is a dominant factor for achieving the full potential and the competitiveness position of their business.

2. Development of IP management excellence audit system

In recent decades, different management techniques, concepts, and principles have been developed by academics and industries. In Europe and the USA, the European Foundation for Quality Management (EFQM, 2007) and Malcolm Baldrige National Quality Award (MBNQA) (United States Department of Commerce, 2007) respectively provide audit framework consisting of “enablers” and “results”. The proposed IP management excellence audit system is also designed with two parts; one is to audit the “systems and practices” and the other is to audit the “results”. The part of “systems and practices”, called “enablers”, helps to examine the IP system and deployment issues in the organization while the “results” part is directly related to the actual outcome of IP management. The elements of the IP management excellence system, presented in Fig. 1a and b, are elaborated below.

2.1. Hierarchy of IP “enablers”

Enablers are defined as the critical managerial and operational elements of good IP management systems and practices. Fig. 1a shows the development of the “enablers” part of the proposed IP management excellence audit system which describes the hierarchical relationships between attributes from the top level through intermediate levels to the lowest level in IP management. In this system, “IP management implementation – systems and practices” is the top level attribute of the evaluation framework. According to the audit system, the “IP management implementation – systems and practices” is assessed based on the evaluation of four IP management enabling categories “management support”, “innovation development”, “intellectual property capitalization” and “external relationship management”. These IP management enabling categories are considered to be level 2 attributes. Each of the IP management enabling categories consists of several key enabling criteria and there are totally twelve enabling criteria, which are considered to be level 3 attributes. The key areas of IP management implementation addressed by each of the attribute from the literature are listed as below:

- (I) Management support (MS) category focuses on organizational leadership, strategy and core competencies that provide support for:
 - (a) *Strategic management plan for IP activities* – Shearer (2007) considers that the CEOs must take leadership, both in setting the IP policies in line with the mission and vision and in creating organization-wide commit-

ment needed to implement the strategies throughout the organization. An organization that effectively deals with the alignment of IP strategies with the business strategies can open up new strategy options to create, protect and exploit an IP portfolio (Reitzig, 2007). In integrating the IP requirements into the organization’s business plan, an organization needs to look at the basic tasks of prioritizing the activities in the IP action plan and allocating the appropriate resources in supporting IP portfolio (Tietze, Granstrand, & Herstatt, 2006). Ford Global Technologies and IBM are examples of organizations that take their initiatives to build successful IP businesses (Shearer, 2007).

- (b) *Internal IP management function, knowledge and skill* – Intangible value now constitutes about 74% of total corporate value based on the Standard and Poor’s 500 Stock Index (Shearer, 2007). To become more competitive and profitable, the organization can capitalize on people by developing and deploying the full potential of the workforce in the area of IP and assigning the right people in IP management functions (Wook, Chul, Bae, & Sang, 2008). Japan and China have recently announced that IP rights are the cornerstones of their 21st-century global strategies where well-educated, resourceful and creative minds of the nations’ people are the focus of organizational productivity in the competitive environment (Shearer, 2007; Yu & Chen, 2006).
 - (c) *IP defense and enforcement system* – The IP litigation control processes play a key role in determining the defensive and offensive actions. Zhou, Mao, and Hou (2007), Elmslie and Portman (2006) and Zhao and Huang (2006) provide some basic concept on the role of IP management function in business. In a defensive role, an organization should adopt the fact finding practices in dealing with the case of IP defense against a third party IP accuser. In an offensive role, an organization should plan IP enforcement strategy for cases of IP infringement against an alleged IP infringer.
- (II) Innovation development (ID) category commits and mobilizes resources for product development to execute:
- (a) *Creativity generation, concept selection and prototyping* – The investment of time, money and efforts enables the organizations to achieve business growth through new technology, product and service development (Bader, 2006; Siskind, 2006). Einhorn (2006) considers that commitment to creativity is treated as a competitive necessity, rather than a competitive advantage, in management of technology/product development and commercialization.
 - (b) *IP intelligence and advisory support* – The increased availability of large, electronic databases concerning patents and the availability of computers have enabled and lowered the cost of many types of analysis (Taylor & Germeraad, 2008). Philopott and Jolly (2004) point out that the vast majority of patents appearing in the databases are free to be read and copied if: they were never granted; or were not kept in force; or do not relate to a territory where the organization plans to make, use, import or sell its product. According to a benchmarking study by Haug (2007), more than 50% of the Fortune 500 firms are now taking a more proactive approach to managing their IP

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