

Chinese vs. European views regarding technology assessment: Convergent or divergent?

Dominique R. Jolly

CERAM Business School, BP 085–60, rue Dostoïevski, 06902 SOPHIA-ANTIPOLIS Cédex, France

Abstract

This paper tries to identify whether Chinese and European assessments of their respective technology portfolios differ. A first question relates to the perceived levels of competitiveness and attractiveness of each technology portfolio. A second question relates to the underlying rationales to technology audit practices: does each of these practices tend to a unique and general model or do they exhibit some idiosyncratic features? Technology audits conducted in 10 Chinese and 40 European companies produced 454 self-assessments: 82 Chinese and 372 European. There are two conclusions: (a) comparisons of means show that attractiveness of technologies does not differ in the Chinese and the European samples; it can be inferred that Chinese and European are targeting technologies with similar value. However, Chinese technological competitiveness was clearly perceived as much lower. This shows that a competitive gap is still clearly perceived between China and Europe. (b) Factorial analyses show that rationales for assessment of technology attractiveness tend to diverge but that rationales for assessment of technological competitiveness tend to follow similar lines in both sub-samples; this is possibly because attractiveness is a culture-based concept while competitiveness is more and more global.

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1. Introduction

Technology and technology transfers have always been an important issue for numerous industries of the Chinese economy since the first days of the Open Door Policy (Bassolino and Tse, 1999; Xu and Chen, 1998; Li-Hua, 2004; Fischer and von Zedtwitz, 2004). Thanks to Chinese industrial and regional policies since 1985, high-tech industries have developed rapidly in the coastal regions—contributing to China's impressive economic growth (Gabriele, 2002; Chen and Shih, 2005). Nowadays, companies in China do not rely solely on external technology providers. An increasing number of Chinese companies have started to develop indigenous technological capabilities by themselves (Yam et al., 2004). Foreign companies in China are also getting more and more involved in research and development (R&D) activities (von Zedtwitz, 2004).

Foreign direct investment has not only led to the transfer of hard-technology to China, but also to the importation of soft managerial skills (Warner, 2002, p. 6). When Western multinational corporations introduce a management technique in China, they also influence other companies. This point is especially arguable for the diffusion of human resource management practices—performance appraisal and compensation (Björkman, 2002) as well as executive career development (Wong and Slater, 2002).

The analysis of cultural convergence and divergence has been identified as a stimulating new avenue for research (Leung et al., 2005). The question is whether cultures are becoming more similar under the forces of globalization. Convergence exists for domains such as consumer values and lifestyles. Implication is the possible emergence of standard business practices. Is technology management one area of convergence? Despite the importance of technology in the Chinese economy, it seems that limited attention has been paid to comparing the way Chinese and European managers manage technology. At the micro-level, one of the very first steps of any management of technology

E-mail address: Dominique.Jolly@Ceram.fr

(MOT) process is the assessment of the technologies in the company's technology portfolio. Technology assessment is useful for internal purposes, i.e. to define where R&D efforts should be directed and organized, as well as for external strategies, such as potential licensing, forming alliances, targeting acquisitions, etc. (Jolly, 2003).

This text compares Chinese and European practices in the domain of technology assessment. The question is: do Chinese managers operate similarly or differently from European managers when they assess technologies? Or, more precisely, whether a tool developed in a Western context is used in the same way by Western and Chinese managers? Some arguments might be suggested in favour of localization of the assessment tools (such as cultural differences). On the contrary, some might argue in favour of a universal model due to an acceleration of the globalization process worldwide. The aim of this paper is to shed light on this issue. The answer to this question is important, since if some divergent rationales do exist, these might create discrepancies in the context of economic relationships with a foreign partner (for example, diverging assessments of one given technology). This will be particularly sensitive if a joint activity is concerned.

The paper starts with a review of the existing literature on technology assessment; the focus is on the multi-criteria used for auditing. Then, problems and hypotheses are discussed. This is followed by methodology, results, discussion and conclusion. This study is probably one of the first to compare Chinese technology auditing practices to European ones.

2. Technology assessment

Most models for technology assessment rely on a two-dimensional framework (Harris et al., 1981; Sethi et al., 1985; Capon and Glazer, 1987; Brockhoff, 1992; Ernst, 1998; Hsuan, 2001). These models consider that there are internal factors which are mainly under the firm's control; these assets depend upon a firm's behaviour and positioning decisions—I will refer to these factors as “the company's technological competitiveness”. On this axis, the position of one company could be very different from the position of another. There are also external factors that are beyond the firm's control—such as the behaviour of customers, competitors, governments and other stakeholders. I will refer here to these elements as “the attractiveness determinants of the technology”. Criteria used for attractiveness of a given technology are important for value creation. They are idiosyncratic to the technology: this means that technological attractiveness is similarly structured for all companies competing in this technology.

The next two paragraphs suggest two sets of criteria for evaluating technology attractiveness (Section 2.1) and technology competitiveness (Section 2.2). These lists originated from the literature review, common sense and several workshops conducted with managers involved in

executive training (a previous version was presented in Jolly, 2003).

2.1. Evaluating technological attractiveness

The attractiveness of a technology appears as a function of various factors. A list of 16 criteria for assessing “technological attractiveness” is given in Table 1. The higher the appeal of each criterion, the higher the attractiveness. Semantic differential scales are given on the right for each criterion; these criteria were co-constructed as part of an executive seminar. It is possible to distinguish between four families: the market potential, the competitive situation, the technical potential and the socio-political situation.

2.1.1. The market potential

Market, demand and customers are key drivers when it comes to making decisions about technology (Bond and Houston, 2003). Factors in this category should express the expected commercial reward that can be gained from a

Table 1
Evaluating technological attractiveness

Environmental factors over which the company has a weak control	Weak attractiveness	High attractiveness
Market potential		
Market volume opened by technology	Low	High
Span of applications opened by technology	Narrow	Wide
Market sensitivity to technical factors	Weak	Strong
Competitive situation		
Number of competitors	Decreasing	Increasing
Competitors' level of involvement	Low	High
Competitive intensity	Weak	Strong
Impact of technology on competitive issues	Low	High
Barriers to copy or imitation	Low	High
Dominant design	Existing	Nonexistent
Technical potential		
Position of the technology in its own life-cycle	Declining	Emerging
Potential for progress	Low	High
Performance gap vis-à-vis alternative technologies	Narrow	Wide
Threat of substitution technologies	High	Low
Potential for unit-to-unit transfers	Difficult	Easy
Socio-political situation		
Societal stakes	Threatening	Supportive
Public support for development	Spartan	Generous

Source: Jolly (2003).

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