Available online at www.sciencedirect.com
SCIENCE DIRECT®
Journal of Operations Management 22 (2004) 439–457
JOURNAL OF OPERATIONS MANAGEMENT
www.elsevier.com/locate/dsw

An exploratory study of the nature of cumulative capabilities

Barbara B. Flynn [a,*], E. James Flynn [b]

[a] *Babcock Graduate School of Management, Wake Forest University, P.O. Box 7659, Reynolda Station, Winston-Salem, NC 27109-7659, USA*
[b] *Wake Forest University, Winston-Salem, NC, USA*

Received 1 July 2002; received in revised form 1 February 2004; accepted 1 March 2004

Available online 28 July 2004

Abstract

This research sets out to test some yet unanswered questions from the literature on cumulative capabilities, as well as addressing some of the shortcomings in prior research on cumulative capabilities. Multiple regression analysis is used to test hypotheses using an existing data set of 165 plants in five countries and three industries. The findings indicate substantial differences in patterns of cumulative capabilities between countries and limited evidence of industry differences. Cumulative capabilities were found to be related to plant performance, with no difference in this relationship by industry. Support for sequential progression of cumulative capabilities was not evident, leading to the notion that development of cumulative capabilities is a complex endeavor, affected by many interrelated contingencies, not limited to sequence of development. A sequence of strategic initiative development was proposed and tested, finding support for a common foundation of practices related to cumulative capabilities, with limited support for the relationship between specific strategic initiatives and higher-level cumulative capabilities.
© 2004 Elsevier B.V. All rights reserved.

Keywords: Operations strategy; Global operations; Quality management

1. Introduction

The relationship between manufacturing capabilities is an important element of operations strategy. Although traditional thinking has been that high performance in one capability is necessarily traded off for low performance in others, recent evidence renders the trade-off perspective less than universal, due to the necessities of global competition and development and dissemination of advanced manufacturing technologies. The focus of this paper is on those manufacturing capabilities that are cumulative, existing simultaneously in a mutually reinforcing fashion, rather than being traded off. This paper explores several important research questions, building on previous research that has supported the existence of cumulative capabilities.

For example, are there environmental contingencies that favor or necessitate cumulative capabilities? Industry maturity and country may be important contingency factors. What is the relationship between cumulative capabilities and plant performance? Although the assumption underlying the literature on cumulative capabilities is that they are related to plant performance, there is little empirical support. Third, are there optimal sequences of development of cumulative capabilities? There is a large body of literature

* Corresponding author. Tel.: +1-336-758-3672; fax: +1-336-758-4515.
E-mail address: barb.flynn@mba.wfu.edu (B.B. Flynn).

0272-6963/$ – see front matter © 2004 Elsevier B.V. All rights reserved.
doi:10.1016/j.jom.2004.03.002

indicating that certain capabilities lay the foundation for developing other capabilities. Although widely cited, this literature has little empirical support. Finally, are there particular strategic initiatives which support the development of cumulative capabilities? A sequential progression of strategic initiatives is proposed and tested.

Many of these questions and issues are not new, however, they have not been fully investigated. This paper provides empirical evidence regarding the nature of cumulative capabilities, their relationship to plant performance and strategic initiatives associated with them.

2. Literature review

2.1. Cumulative capabilities

The notion of trade-offs may be irrelevant in an environment characterized by advanced manufacturing technologies and global competition, with intensified pressures on plants to improve on all dimensions (Boyer and Lewis, 2002). The term "cumulative capabilities" describes high performance in multiple capabilities simultaneously. Capabilities are described as cumulative because they build upon each other and are mutually reinforcing (Boyer and Lewis, 2002; Noble, 1995). Although some authors discuss an optimal sequence of cumulative capabilities (Ferdows and DeMeyer, 1990; Nakane, 1986; Hall, 1987), the term is used here more generically to describe a situation where a plant has a high level of performance in more than one capability. In their law of cumulative capabilities, Schmenner and Swink (1998) stated that improvement in certain capabilities enables improvements to be made more easily in other capabilities. This is supported by evidence from Japanese manufacturers, where some firms have led their competitors in almost every capability (Schmenner and Swink, 1998; Boyer and Lewis, 2002) and the world-class manufacturing perspective (Hayes and Pisano, 1994; Kane, 1999).

Although there is a solid foundation of research on cumulative capabilities, there are some issues raised by prior research which remain. These include the use of multiple terms for the same concept, operationalization of the cumulative capabilities construct, confusion in definition of specific capabilities, the relationship of cumulative capabilities to performance, optimal sequences of cumulative capabilities and identification of the environmental and structural contingencies under which cumulative capabilities are more likely.

2.2. Definitional issues

The concept of cumulative capabilities has been described by various authors using different terminology, leading to confusion in generalizing between studies. The strategic management literature tends to use the terms generic strategies, competitive advantages and competitive priorities (Galbraith and Schendel, 1983; Murray, 1988), while the operations management literature uses terminology such as capabilities, competencies and priorities (Noble, 1995; Boyer and Lewis, 2002). There is also disagreement on how to operationalize capabilities; for example, is high performance best operationalized as the industry leader, top 10% in the industry, above average for the industry, etc.? Too narrow a definition makes the construct of cumulative capabilities difficult to study, while too broad a definition dilutes its importance. Thus, prior research on cumulative capabilities lacks precise and parsimonious definitions (Swink and Way, 1995).

A second problem is related to the definition of specific capabilities. Although most capabilities are multidimensional, they are typically operationalized using a single dimension. For example, dependability is alternatively defined as on-time delivery of products (Hayes and Wheelwright, 1984; Noble, 1995) and fast delivery (Hall, 1987; Ferdows and DeMeyer, 1990). These are distinctly different dimensions, since on-time delivery suggests early delivery is undesirable, while fast delivery emphasizes delivery as quickly as possible. Speed (Blackburn, 1991; Thomke, 1998) is operationalized as both cycle time (the total time items spend in the plant), and new product speed (the speed with which new products are brought to the market). Flexibility (Swamidass, 1988; Hayes and Wheelwright, 1984; Upton, 1995) can be operationalized as product mix flexibility (the ability to handle difficult or non-standard orders) and volume flexibility (the ability to accelerate or decelerate production very quickly). Quality can be defined by as many as eight dimensions (Garvin, 1987). While there are certainly finer-grained distinctions that can be made between

دریافت فوری ← متن کامل مقاله

ISIArticles
مرجع مقالات تخصصی ایران

✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
✓ امکان دانلود نسخه ترجمه شده مقالات
✓ پذیرش سفارش ترجمه تخصصی
✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
✓ دانلود فوری مقاله پس از پرداخت آنلاین
✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات