CITY UNIVERSITY OF HONG KONG
香港城市大學

Creating Global Dynamic Capabilities:
R&D Network Management
for Globally Distributed
Research and Development
in the Software Industry

創造環球動態能力：
軟件工業中對全球分佈的
研究與開發網絡的管理

Submitted to

College of Business

商學院

in Partial Fulfillment of the Requirements

for the Degree of Doctor of Business Administration

工商管理學博士學位

by

Markus Alsleben

馬雷鵬

July 2012

二零一二年七月

ABSTRACT

The sustainable long-term growth and survival of a corporation can only be achieved through the ongoing creation of innovative products and services. This is especially true in today's global software industry, which is characterized by ever-shorter product cycles, intense global competition and knowledge-intense research and development (R&D). The effective organization and management of a corporate R&D function in a software enterprise has thus become a key success factor for sustainable competitive advantages.

This dissertation designs, implements and evaluates an organizational transformation and its supporting framework for a globally dispersed R&D organization in the software industry as part of a two-year longitudinal case study at SAP, one of world's largest software company.

Based on the action design research methodology, this cross-disciplinary participatory study, which draws from the areas of strategic management, global R&D management, organizational theory and organizational change management, to take a systematic approach to investigate this phenomenon and obtain a normative model of global R&D organizational enhancements, thus informing managerial practice related to the improvement of global R&D networks. Although it focuses on global R&D network improvement in the software industry, the major research outcomes are likely to be generalized and applied to other industries that follow a globally distributed R&D model.

The findings of this thesis indicate that the successful organizational transformation of a global R&D network requires that R&D network management be established as a new dynamic capability to achieve and secure competitive advantages in high-velocity environments. Dynamic capabilities are especially critical in responding to the frequent disruptive innovations, mergers and acquisitions and new business models that characterize the global software industry, as they allow for the ongoing reconfiguration of the firm's tangible and intangible assets. In this study, the dynamic capability of R&D network management is understood to comprise the key abilities of sensing, seizing and transforming threats in the tradition of Teece et al. (2009).

The case study conducted as part of this thesis describes how the enterprise under study established these key abilities through an organizational intervention. First, sensing incorporates the definition and frequent updating of location strategy for each of the three archetype business models (product, customer, infrastructure) found inside each company, including guidelines and policies for global work design and the allocation of R&D resources. Second, seizing provides geographical information system designs and the location-specific consolidation of internal and external key performance indicators to create global organizational transparency and identify global location portfolio trends at an early stage.

Though the action design research, which the author actively conducted with a dedicated project team, the enterprise under study established the ability to seize by setting up a dedicated location

management organization with cross-functional team members to run an integrated location management process in which individual location decisions are made and reviewed in accordance with location strategy and guidelines. The enterprise's ability to transform itself in the global R&D network management context was achieved by defragmenting software development teams around the world, employing communication efficiency as efficiency criterion, principles of lean work organization as major design criteria and rationalizing historical locations that no longer fit the firm's location strategy.

This study makes a significant contribution to the strategy management field and its theory of dynamic capabilities by describing a model for implementing dynamic capabilities through organizational interventions. The study identifies the modular design of R&D networks as the next evolutionary stage in R&D globalization and shows how a fragmented global R&D organization was transformed into a modular global R&D function, an organizational form with significantly lower coordination costs. As global R&D networks continue to actively manage and reconfigure their global location portfolios and team allocations, this study shows how global R&D network management can be introduced as a dynamic capability through organizational interventions such as that implemented at SAP.