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TRYING TO BECOME A DIFFERENT TYPE OF COMPANY: DYNAMIC CAPABILITY AT SMITH CORONA

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Smith Corona, formerly one of the world's leading manufacturers of typewriters, was challenged to exercise dynamic capability in the face of the dissipation of its main product category. A study of the last two decades of the life of the company shows how Smith Corona tried to alter its resource base by leveraging existing resources, creating new resources, accessing external resources, and releasing resources. Using the extended case method, this study advances dynamic capability theory by confronting it with an empirical case. The Smith Corona case provides rich insights into the resource alteration processes by which dynamic capability operates, and highlights resource cognition as a missing element in dynamic capability theory. Copyright © 2010 John Wiley & Sons, Ltd.

What experience and history teach is this—that peoples and governments never have learned anything from history, or acted on principles deduced from it. (Georg Wilhelm Friedrich Hegel, Philosophy of History, [1831] 1991: 6)

INTRODUCTION

Scholars and managers have long tried to understand why some firms survive and even prosper in the face of environmental changes, while others wither. To cope with environmental changes, firms need to renew themselves (Dierickx and Cool, 1989; Floyd and Lane, 2000). Inability to do so may have severe consequences for firms, the people they employ, and the communities in which they operate. Organizational renewal involves changing organizational resources and competences over time, often accompanied by a change in the organization's products (Baden-Fuller and Stopford, 1994; Floyd and Lane, 2000). Why are some firms able to renew themselves when environmental changes threaten their long-run viability, while others are not? One of the most prominent theories proposed to address this question revolves around the notion of 'dynamic capability.' Dynamic capability refers to the ability of a firm to renew itself in the face of a changing environment (Teece, Pisano, and Shuen, 1997) by changing its set of resources (Eisenhardt and Martin, 2000). The term 'dynamic' refers to the renewal of resources and competences to address changing environments. Dynamic capability theory states that some firms thrive in the face of environmental changes because they have the ability to change their resources (Teece, Pisano, and Shuen, 1997; Eisenhardt and Martin, 2000). Changes in the firm's set of resources can be achieved by

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various modes: leveraging, creating, accessing, and releasing (Eisenhardt and Martin, 2000).

To date, the discourse on dynamic capabilities has taken place at an abstract and even esoteric level (Kraatz and Zajac, 2001). In addition, there is a dearth of empirical research on dynamic capabilities (Barr, 2004). The purpose of this study is to advance dynamic capability theory by confronting it with an empirical case. I use the extended case method (Burawoy, 1991), which draws on a detailed study of a case to extend current theory. I start from the existing dynamic capability theory, in particular its enumeration of resource alteration modes, and confront these ways of resource alteration with the empirical context provided by Smith Corona, formerly one of the world's leading manufacturers of typewriters. I examine how Smith Corona implemented each of these modes and show how dynamic capability theory can be extended by relating it to other literatures, and reveal a gap in the theory.

Smith Corona is a salient example of a company that needed to renew its resource base in the face of the environmental changes that obsolesced its main product category, typewriters. The decline of its core product category challenged the firm to exercise dynamic capability, lest it decline and eventually demise with the product. Even though the exact form of the product life cycle has long been debated, product categories go through stages that consist of introduction, growth, maturity, and decline (Day, 1981; Lambkin and Day, 1989). The decline of the typewriter product category was precipitated by various environmental changes, such as the increasing computer literacy among consumers, the development of electronic circuitry and software, and changes in channels of distribution. Thus, to avoid declining along with its product category and to survive as a firm, Smith Corona needed to enter into other product categories, which required access to the resources underlying these products (Danneels, 2002; Teece, 1982). Smith Corona was challenged to find a new product domain position and to renew its resource base (Danneels, 2002; Floyd and Lane, 2000). However, its attempts at renewal did not result in viable new products enabled by a new set of resources.

In their seminal article, Eisenhardt and Martin (2000) stated that the firm's resource base can be altered in various ways, such as leveraging, creating, accessing, and releasing. However, these modes of dynamic capability have remained inside a 'process black box' (Priem and Butler, 2001a: 33); there is a lack of knowledge about how dynamic capability is exercised, that is, how and why resource alteration modes are used. I will confront the modes of resource alteration enumerated in dynamic capability theory (Eisenhardt and Martin, 2000) with detailed data on Smith Corona, a firm that tried to change its resource portfolio to cope with environmental changes and attempted to renew its resource base in response to the growing obsolescence of its core product category.[1] Smith Corona is a particularly well suited case to study the exercise of dynamic capability because the necessity of resource renewal was sharply pronounced as its core product category decline threatened its survival. In 1980, Smith Corona had about 50 percent of the U.S. market in typewriters, was shipping over a million typewriters per year, and employed over 4,000 people. In 2001, Smith Corona was gasping its last breath, undergoing liquidation. The study of a firm that failed may have a higher potential for contributing to dynamic capability theory because, as eloquently stated by Williamson (1999: 1093 fn 3): 'More informative, often, than success stories are stories about failure—especially the failures of once successful enterprises to adapt to new circumstances' (see also Denrell, 2003; Priem and Butler, 2001a; 2001b).

After discussing the data collection and data analysis procedures, I examine how Smith Corona attempted each of the various modes of dynamic capability: leveraging existing resources, creating new resources, accessing external resources, and releasing resources. First, leveraging existing resources involves putting them to new uses (Danneels, 2002, 2007; Miller, 2003). A resource is a tangible or intangible asset that the firm owns, controls, or has access to and from which it potentially derives rents (Helfat and Peteraf, 2003). Some resources are fungible, that is, amenable to multiple applications (Teece, 1982). For example, resources embedded in products such as brand, distribution access, and manufacturing facilities may be leveraged by applying them to other products. However, resources vary in the extent to

[1] Smith Corona also had two wholly owned subsidiaries in office paper supplies, stationery, and office forms, which were combined with the typewriter business in a 1982 reorganization within SCM. Because they represent a small portion of its business, I do not discuss them herein.

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which they are product-specific versus fungible, and hence vary in the extent to which they can be leveraged from current products to new products (Danneels, 2002, 2007). Smith Corona tried to leverage its brand, distribution, and customer understandings in order to enter product categories other than typewriters. Second, new resources could be created internally and combined to form a new competence. A competence is a configuration of resources that enables the firm to accomplish a particular task (Grant, 1991; Helfat and Peteraf, 2003; McGrath, MacMillan, and Venkataraman, 1995; Verona, 1999). Adding resources and configuring them into competences involves explorative learning (Floyd and Lane, 2000; March, 1991; Levinthal and March, 1993). The ability of a firm to build new competences has been referred to as a second-order competence (Danneels, 2002). While Smith Corona built a competence in electronics that led to great success with extensions of its typewriter category, after that it did not add any proprietary technology that would have enhanced its entries into other product categories. Third, it is possible to access new resources externally. Sometimes complementary resources can be accessed externally and be configured with current resources. Smith Corona tried to access external complementary technically related resources through alliances, but found that its market-related resources did not add value to alliance partners nor to the products sourced from them. Finally, the alteration of a firm's set of resources may involve dropping existing resources, such as by selling assets or reducing workforce, which Smith Corona did in order to support losing operations rather than to foster renewal.

The Smith Corona case will provide rich insights into the resource alteration processes by which dynamic capabilities operate, and hence start to fill the process gap in dynamic capability theory. In addition, the examination of the modes of dynamic capability (leveraging, creating, accessing, and releasing) will highlight a missing element in dynamic capability theory: resource cognition. Correcting strategy's excessive focus on environmental conditions, Teece *et al*. (1997: 513) argued that 'what a firm can do is not just a function of the opportunities it confronts; it also depends on what resources the organization can muster.' This study will add to this insight that what resources managers try to muster depends on their mental models of these resources. I argue that managerial cognition about firm resources is essential to explaining the exercise of dynamic capability, as the identification of resources and the understanding of their fungibility affect which directions of renewal are pursued.

METHOD

This study follows in a tradition of in-depth historical case studies on the effects of market and technological changes on a firm, and the response of the focal firm to such changes. Prominent exemplars include Burgelman's (1991, 1994) studies of Intel's transition from memory chips to microprocessors, Rosenbloom's (2000) study of how NCR transitioned into an electronics-based office equipment company, Sull's (1999) study of Firestone's impediments to adoption of radial tire technology (1999), and Tripsas and Gavetti's (2000) study of how Polaroid's obsolete business model hampered entry into digital photography. Smith Corona is a particularly attractive firm for a detailed historical case study (cf. Golder, 2000). Because the firm's demise in 2001 is recent, key decision makers of the last two decades could be located and interviewed. Because press articles were archived digitally since the early 1980s, database searches were much facilitated. Additionally, because Smith Corona was well known, it received a lot of press attention. Finally, as the firm was publicly traded, financial statements, management discussions, stock market data, and press releases were available.

The focal period of interest is 1980 to 2001. The study period starts in 1980 when Smith Corona introduced its first electronic typewriter, continues through the period that the personal computer (PC) obsolesced typewriters, and ends with the liquidation of the company in 2001. The first step of my data gathering was to develop a comprehensive collection of publicly accessible sources of evidence. I collected extensive archival data on Smith Corona and the typewriter industry in general. Most of these data come from the trade press and business press, and were collected in exhaustive searches of Factiva, Lexis-Nexis, InfoTrac, EBSCO, and ProQuest. Key industry publications used include *HFN: The Weekly Newspaper for the Home Furnishing Network; TWICE: This*

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Week in Consumer Electronics; The Office; Dealerscope Merchandising; and *Modern Office Technology*. Additional data were gathered from the Securities and Exchange Commission's (SEC) filings, *Moody's Industrial Manual*, and Value Line. I also collected about 20 actual products and 50 advertisements through eBay. I collected data from the U.S. Census Bureau and Gale Research's U.S. Industry Profiles, International Data Corporation (IDC), and Standard and Poor's (S&P) Industry Surveys about general industry trends. I also secured detailed data on shipments, sales, prices, and market shares from the market research firm Venture Development Corporation, which produced annual reports from 1981 to 1997. In all, I gathered about 3,000 pages of press articles, 1,000 pages of SEC filings, and 3,000 pages of industry data. A complete set of company newsletters was reviewed and selectively copied at the Cortland County Historical Society. Based on these archives, I constructed an event timeline, which consists of 87 discrete events (list of events available upon request).

To supplement my detailed archival data, I conducted interviews with key decision makers of the company from 1980 to 2001. To collect these primary data, I identified top management team members and board members through SEC filings and interviews reported in the press, and gained contact information on most of them. I sent a letter of invitation to all those for whom I had contact information, sometimes followed up with phone calls. Of the 21 informants for whom I could confirm contact information, and who were in good health, only two declined (two others were unavailable). I interviewed 17 top managers (vice presidents and chief executive officers [CEOs]) and board members—all but two interviews were conducted face-to-face. To protect confidentiality, I present quotes with only the title of the interviewee. Each quote could refer to any holder of such title in the focal study period.

Interviews focused on the circumstances and reasons of the events during the informant's tenure. Where available, I brought press articles in which informants were quoted, and asked them to review and expand on those statements. Interviews commonly lasted from one to two hours, and were recorded with permission. The recordings were transcribed verbatim. To confirm the accuracy of my facts and the credibility of my interpretations, I exchanged emails with some of the interviewees. These member checks served to revise and clarify the history and findings discussed below (Hirschman, 1986; Lincoln and Guba, 1985). Some of the interviewees provided internal company documents such as memos, meeting minutes, employee handbooks, and project proposals.

Interviews were long-term retrospective, and therefore open to potential critique regarding memory loss and retrospective rationalization. While these may be limitations, the elapsed time also engendered greater openness among respondents (statements no longer affected their career). In addition, information from interviews was triangulated with information from other interviews as well as contemporaneous secondary data (Cardinal, Sitkin, and Long, 2004; Jick, 1979; Golder, 2000).

I used the extended case method, which uses empirical data gathered through case studies to reconceptualize and extend theory (Burawoy, 1991). The extended case method approach goes through many cycles of confrontation between data and theory in each iteration, directing the analyst to additional data and drawing on additional concepts and theories. The extended case method consists of two 'running exchange[s]' (Burawoy 1991: 10–11): between literature review and data analysis, and between data analysis and data collection, represented as: literature review ⇔ data analysis ⇔ data collection.

The first running exchange involves the interplay of existing concepts/theories and analysis of empirical data. In the extended case method, intensive analysis of the data and exploration of the scholarly literature occur in conjunction. Data analysis points to relevant concepts and theories in the literature, while the literature simultaneously provides conceptual frameworks to aid in the interpretation of the data. This study started with the dynamic capabilities literature, which after confrontation with the Smith Corona case, led into literatures about distinct areas such as resource fungibility, brand extension, and organizational cognition. The second running exchange calls for continuously moving back and forth between data collection and analysis. The analysis of initial data (itself informed by the first exchange) suggests additional information to be collected. For example, in the course of this study, I was directed to the brand extension literature by the repeated mention in both interview and archival data of the effort to use the

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Smith Corona brand to enter new product areas. I subsequently examined brand extension research and found a plausible cause of the failure of new products: the product-specificity of the brand. Subsequent thought trials (Weick, 1989) and case evidence provided further support for the limitation of the brand.

I generated memos when analyzing transcripts, documents, and scholarly literature. Memos are brief analytical notes that contain insights that the researcher achieves as he/she proceeds with the analysis (Strauss, 1987). I continuously matched and contrasted memos to refine theoretical understanding (McCracken, 1988), and I systematically compared the emergent theoretical interpretations contained in the memos with the evidence to assess how well or how poorly they fit with the case data (Eisenhardt, 1989). This iterative process of constantly comparing emergent theory and data led to additional more qualified and refined memos.

The following provides an example of the role that memos played in the iterations between data collection, data analysis, and theory. In a memo I asked: 'Why did Smith Corona try this particular sequence of product categories after the ET [electronic typewriter] and PWP [personal word processor] (electronic reference products, PCs, printer, faxes, etc.)?' This line of thought was discontinued when interviews revealed there was no rationale to the sequence of attempted product entries; rather it was opportunistic based on available products from third-party vendors for printers, faxes, and so forth. This led to the recognition that since the new product categories were all sourced, their brand was likely the only differentiator with competitive products. I subsequently asked questions to determine whether Smith Corona had any input into product design, or whether they were simply sourced on the open market and branded. Since the latter was the case, it became clear that neither the brand nor customer understandings, as resources of the firm, added value to the products.

In order to organize and analyze my data, the development of three tables was instrumental. Table 1 contains the key numerical data about Smith Corona over the focal study period from 1979 to 2000. I assembled these annual data, mainly drawing on the annual reports, the prospectus, and the Chapter 11 filings. Another data table (not included due to space constraints) lists the key events in the history of Smith Corona. Table 2 presents an overview of the core concepts, their related concepts and literature, and how they were empirically manifested in the case. In order to '... describe the case in sufficient descriptive narrative so that readers can experience these happenings vicariously and draw their own conclusions' (Stake, 2005: 450), I provide ample interview segments in the findings, and start with a brief historical context.

A BRIEF HISTORY OF SMITH CORONA

Even though the focus of this article is the 20-year period before Smith Corona's demise in 2001, it is helpful to summarize the history of the company preceding this period. In 1886, the brothers Lyman, Wilbert, Monroe, and Hurlburt Smith, who owned the L.C. Smith Shotgun Company of Syracuse, New York, founded the Smith-Premier Typewriter Company. Its first product was the Smith-Premier, a heavy office typewriter. In 1893 Smith-Premier merged with six other typewriter manufacturers to form the Union Typewriter Company of America. The star product of Union Typewriter remained the Smith-Premier, which after Remington was the most successful typewriter in the last decade of the 19th century. In 1896 the 'visible writing' typewriter was invented, which allowed typists to see what they had typed without having to lift the carriage. After failing to convince their partners of the need to shift to the user-friendly design, the Smith brothers quit Union Typewriter and, in 1903, founded the L.C. Smith & Brothers Typewriter Company in Syracuse. Visible typewriters became the prevailing design.

Yet, the writing machines made by L.C. Smith & Brothers were unwieldy, heavy, and for office use only. Standard Typewriter Company (founded as the Rose Typewriter Company in 1906), was producing a folding typewriter. This first portable typewriter had a carrying case, weighed just six pounds, and featured a carriage that folded over the keyboard. This folding typewriter took market leadership in the portable segment and became the standard for journalists and the military in World War I. Standard's next model, the 'Corona,' met with such great success that in 1914 it was renamed the Corona Typewriter Company.

L.C. Smith & Brothers and Corona merged in 1926 to become L.C. Smith & Corona. Their focus on user-friendly and portable typewriters would set their future path. Some 3,000 people were

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Table 1. Key numerical data on Smith Corona*

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Annual sales	195.1	197.6	195.5	177.4	164.3	198.5	176.3	212.8	259	307.1
% annual sales growth rate		1.3%	−1.1%	−9.3%	−7.4%	20.8%	−11.2%	20.7%	21.7%	18.6%
New product sales										
% of sales to Walmart									<10%	<10%
# US employees	4200	4065	3300	3400	3000	1200	950	1300	2300	2000
# Employees worldwide			4000							
R&D expenditures**									5.7	6.3
R&D intensity (R&D/sales)**									2.2%	2.1%
Advertising expenditures**									11.2	15.3
Advertising intensity (advertising/sales)**									4.3%	5.0%
Total assets	138.8	153.3	148.1	148.6	148.6	149.1	123	122.3	156.6	156.1
			1981 to 1985: $114.6 million cumulative operating losses							
Operating income	20.7	5.4	−15.9	−23.8	−11.6	−15.9	−47.4	23.5	42.4	60
ROA (operating income/assets)	0.149	0.035	−0.107	−0.160	−0.078	−0.107	−0.385	0.192	0.271	0.384
Operating margin (operating income/sales)	10.6%	2.7%	−8.1%	−13.4%	−7.1%	−8.0%	−26.9%	11.0%	16.4%	19.5%
Net income**								15.2	23.6	38.8
Current ratio**	2.4	2.4	2.3	2.1	2.7	2.5	2.1	2.2	2.6	2.6
Total debt to total capital**	40.5	38	37.6	39.5	38	35.6	44.1	66.6	56.2	56.2
Stock price (at ling of 10K in September)										
Shares outstanding (in millions)										
Market value (in millions)										
% of total sales from ET									61.9%	56.7%
% of total sales from PWP									2.3%	8.9%
% of total sales from ET/PWP Supplies and Accessories									<10%	<10%

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Annual sales	401.8	372.5	302.3	294.3	232.3	261.3	196.3	112.5	77.3	58.9	43.7	30
% annual sales growth rate	30.8%	−7.3%	−18.8%	−2.6%	−21.1%	12.5%	−24.9%	−42.7%	−31.3%	−23.8%	−25.8%	−31.4%
	Sales peak in 1989 and decline rapidly thereafter						**Sales from non-typewriter products never reach more than 11.8%**					
New product sales						7.6	11.8	7.5	0	3.8	6	
of sales to Walmart	<10%	<10%	5.0%	5.1%	12.3%	12.2%	14.0%	10.1%	19.8%	29.7%	27.0%	
# US employees		1600	1350	450	450	450	375	320	300	225	94	43
# Employees worldwide		3600	3300	3600	3400	3000	2300	1100	1000	225	94	43
R&D expenditures**	8.4	9.4	9.1	11	10.1	8	7.2	2	1.9	4.8	1.9	
R&D intensity (R&D/sales)**	2.1%	2.5%	3.0%	3.7%	4.3%	3.1%	3.7%	1.8%	2.5%	8.1%	4.3%	
Advertising expenditures**	16.4	14.3	8.3	8.0	7.8	3.2	0.0	0.0	1.2	6.0	1.6	
Advertising intensity (advertising/sales)**	4.1%	3.8%	2.7%	2.7%	3.4%	1.2%	0.0%	0.0%	1.6%	10.2%	3.7%	
Total assets	245.6	221.8	182.3	190.4	197.9	195	136.1	83.9	60.6	50.1	22.2	15.2

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Table 1. (*Continued*)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
							Assets are sold to sustain the firm					
Operating income	51.1	47.6	29.1	30.1	−15.1	7.7	–47.7	–9.1	–0.8	–7.8	–15.9	–3.8
ROA (operating income/assets)	0.208	0.215	0.160	0.158	–0.076	0.039	–0.350	–0.108	–0.013	–0.156	–0.716	–0.250
Operating margin (operating income/sales)	12.7%	12.8%	9.6%	10.2%	–6.5%	2.9%	–24.3%	–8.1%	—1.0%	—13.2%	–36.4%	–12.7%
Net income**	42	33.5	19.6	22.1	–9	5.1	–52.4	–11.1	–7.3	–6.6	–15.9	–3.9
						1993 is first lost year						
Current ratio***	2.4	2.7	2.7	2.2	2.3	2.3	1.4	4.7	2.3	2.5	1.9	1.4
Total debt to total capital***	65.5	51.3	29.2	9.7	19.7	20.9	46.2	0	0	0	0	0
	Liquidity remains the same and debt is paid down substantially											
Stock price (at ling of 10K in September)	21	4.5	7.25	6.5	4.75	4.5	0.6	0.05	3.6	5.5	1.2	0.34
Shares outstanding (in millions)	30.25	30.25	30.25	30.25	30.25	30.25	30.25	30.25	2.76	2.98	3.06	3.22
Market value (in millions)	635.3	136.1	219.3	196.6	143.7	136.1	18.2	1.5	9.9	16.4	3.7	1.1
% of total sales from ET	52.6%	42.3%	42.4%	45.6%	41.3%	40.6%	39.7%	38.1%	45.1%	49.4%	44.6%	
% of total sales from PWP	16.2%	21.4%	18.4%	18.2%	34.5%	37.1%	34.5%	21.8%	11.5%	<10%	<10%	
% of total sales from ET/PWP Supplies and Accessories	<10%	<10%	<10%	<10%	<10%	<10%	20.0%	29.4%	36.5%	35.4%	38.2%	
								Increasing reliance on supplies and accessories				

* Sales and operating income do not include the office supplies subsidiaries (SCM OSI and Histacount were subsidiaries 1989–1995)
Net income includes the office supplies subsidiaries (SCM OSI and Histacount were subsidiaries 1989–1995)
All figures are expressed in millions (except stock price)
Unless otherwise noted, for the periods when SC was part of SCM (1979–1985) and Hanson (1986–1989) figures reflect the SC Division only
Figures reflect fiscal years ended June 30 of each calender year
Fiscal 2000 estimates based on last filed Quarterly Report (December 1999)
** Information available starting 1987 based on SEC filings by Smith Corona Corporation starting with its IPO in 1989
*** Reflect the parent corporation from 1979 to 1987 (SCM 1979–1985 and Hanson 1986–1987)

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employed by the new company prior to the Depression, which started in 1929. At the start of World War II, L.C. Smith & Corona had to cease the production of typewriters to make war equipment such as bomb fuses, cryptographic equipment, and Springfield rifles. In 1943, the company started to manufacture typewriters again.[2]

In 1946, the firm changed its name to Smith Corona. In 1955 Smith Corona introduced its first electric typewriter for the office, and in 1957 it introduced the world's first portable electric typewriter. In the50s and 1960s, the company followed the trend toward conglomeration of unrelated businesses (Davis, Diekmann, and Tinsley, 1994). In 1956, Smith Corona began to diversify with the purchase of Kleinschmidt Laboratories, a producer of telecommunications equipment. The merger with the Marchant Calculator Company in 1958 led to Smith Corona's entry into electro-mechanical calculators, which was followed by entry into office copiers. The resulting Smith Corona Marchant Inc. continued to diversify and changed its name to SCM Corporation in 1962. Acquisitions during the 1960s further enlarged the size and scope of the corporation. Among the largest additions were the Glidden Company (paints and chemicals), Durkee Foods, Proctor Silex (appliances), and Allied Paper.

In the late 1960s and early 1970s, Smith Corona, the typewriter business unit of SCM, exited calculators and copiers. Its mechanical calculators were displaced by competitors' electronic ones, while plain-paper copiers (for which Xerox held the proprietary technology) were favored over Smith Corona's coated-paper copiers. The company focused on portable (or compact), rather than office typewriters.

Besides some minor design changes, the only important novelty in typewriters in the 1970s was the first removable cartridge ribbon system. The 'Coronamatic Cartridge' (introduced in 1973) replaced the ribbon that was wound on two spools and made it possible to change the ribbon quickly without touching the inked surface.

In 1974, Smith Corona began its fight against alleged dumping by Japanese competitors, a fight that would last for two decades. Also in 1974, Smith Corona reached its highest ever employment of 5,300, with over 4,000 manufacturing employees in Cortland, New York and the rest in the new (opened in 1973) plant in Singapore.

In the late 1970s, office ETs were pioneered by Qyx (a unit of Exxon), IBM, Xerox (in 1978), soon followed by Olivetti and Olympia (in 1979). ETs typewriter business unit of SCM use microprocessor and memory integrated circuits, which allow for character storage and limited text formatting. They also have small displays of one or two lines of text, which allow users to view and change text before it is printed.

Several years earlier, Smith Corona had started to build a technological competence in electronics by hiring electrical engineers and setting up a separate organization in Connecticut, far away from the manufacturing site in New York. In 1976, the Danbury, Connecticut research and development (R&D) lab opened (company newsletter, Spring, 1976). This effort resulted in the Typetronic, an office ET, introduced in 1980. In all, the company spent $25 million on R&D and introductory expenses for its first ET entry (for comparison, this is 12.7 percent of 1980 sales), which nevertheless was plagued by manufacturing difficulties.

The company introduced a series of ETs, which in 1983 represented about 25 percent of its sales (company newsletter, November, 1983). Most notable were the computer-compatible 'dual-purpose' typewriters, which could be connected to computers and serve as printers. Because they used the daisywheel printing technology, these printers delivered high-quality character print, but were slow and incapable of printing graphics. Smith Corona also introduced a series of daisywheel printers, which were derivative of the ET platform, and could be connected with personal computers. Throughout the 1980s, ETs were introduced with increasingly sophisticated features, with apt names such as Word Eraser, Spell Right, and Grammar Right. In 1985, the company introduced its first PWP. Unlike the small display of an ET, a PWP has a screen-like display and a larger memory, which allow for easier text editing. Its editing capability (e.g., store, insert, delete, move, find, replace text) makes its functionality similar to that of computer-based word processing software. PWPs also have removable memory disks,

[2] For further details on the early history of Smith Corona, see Beeching ([1974] 1990), Typewriter Topics ([1924] 2000), and Smith Corona (1946). Since there is no published history of Smith Corona after World War II, the post-war events were assembled from a myriad of sources such as business press articles, SEC filings, company documents, and cross-checked with the interviewees.

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Table 2. Conceptual framework

Core concepts	Related concepts with key references	Empirical phenomena
Resource alteration mode: leveraging existing resources	Fungibility (Danneels, 2002, 2007; Miller, 2003; Penrose, 1959; Teece, 1982) Brand extension (Herr *et al*., 1996; Meyvis and Janiszewski, 2004) Customer understandings (Danneels, 2003)	Smith Corona identified brand and distribution as its key resources that would enable it to enter 'small office/home office' product categories Smith Corona brand was not fungible due to dominant product category association Independent office stores were displaced by large retailers Shallow customer understandings did not help to develop superior products
Resource alteration mode: creating new resources	Second-order R&D competence (Danneels, 2002) Exploration/exploitation (Levinthal and March, 1993; March 1991)	Smith Corona developed electronics competence (set up electronics R&D facility in Connecticut in 1976—developed electronics manufacturing expertise and facilities in late70s/early 80s) Electronics competence formed the basis of entry into two new product categories (introduced its first electronic typewriter in 1980, and its first personal word processors in 1985) Did not develop any new technology after electronics—R&D became exploitative (moved R&D facilities next to manufacturing plant in New York in 1982) Did not have proprietary technology to enhance other product entries
Resource alteration mode: accessing external resources	Alliances (Das and Teng, 2000; Harrison *et al*., 2001; Kale *et al*., 2002) Complementary resources (Harrison *et al*., 2001)	Smith Corona relied on sourcing alliances to enter the product categories outside of typewriters (labeled sourced product with its brand) Smith Corona tried to access external complementary technically related resources through alliances (alliance with Acer to introduce Smith Corona branded PCs) Smith Corona's market-related resources (brand and distribution) did not have value for alliance partners or potential acquirers
Resource alteration mode: releasing resources	Asset divestment (Harrigan, 1980)	Reduced workforce in early 1980s and throughout the 1990s Smith Corona sold off manufacturing assets (moved manufacturing from New York to Mexico starting in 1991—sold Singapore facility in 1995) Asset sales sustained losing operation
Resource cognition	Schema (Fiske and Taylor, 1984; Stubbart, 1989; Walsh, 1995) Evaluation of brand extensions (Meyvis and Janiszewski, 2004) Product category substitution (Adner and Levinthal, 2001; Danneels, 2004)	Identified as key resources its brand and customer understandings, but not its manufacturing skills and equipment. Did not recognize lack of fungibility of the brand and superficiality of customer understandings. Failed to learn from failed brand extensions Dismissed PC as a substitute product

but their software is permanently encoded and cannot be updated.

In 1981, Smith Corona started to lose money, the beginning of five years of losses, that cumulated to $114.6 million by 1986 (see Table 1). With the company running deeply in the red, a major restructuring of the operations was implemented that resulted in substantially reduced manufacturing costs, a 50 percent reduction in worldwide employment, and the consolidation of United States operations.

In 1986, after a hostile takeover court battle, the British conglomerate Hanson Trust acquired Smith Corona as part of the $930 acquisition of SCM. Hanson soon sold the paint, paper, and food businesses, making back its $930 million investment in one year, while still retaining Smith Corona and the extremely profitable titanium dioxide chemicals business. Hanson took Smith Corona public in an initial public offering (IPO) in July of 1989, which coincidentally or not, was right at the peak of Smith Corona's performance. Hanson retained 47.9 percent of the company's shares and placed four directors on its nine-member board. Shortly after the IPO on the New York Stock Exchange, news of declining demand started a steep decline in the stock price. The stock dropped from the IPO price of $21 a share to $5 a share a year later.

In 1986, the ET became successful in the marketplace, and Smith Corona started to turn a profit. From 1986 to 1989 Smith Corona's sales and profits climbed steadily and operating margins edged up to an impressive 19.5 percent in fiscal 1988 (see Table 1). Manufacturing could barely keep up with demand. Smith Corona's PWPs became increasingly more like computers. Smith Corona launched the world's first laptop PWP, made its PWPs DOS compatible, developed spreadsheet software for them (called 'CoronaCalc'), and used standard 3.5 inch disks. Files were made convertible to ASCII, WordPerfect, and Lotus123, and were thus transferable to PCs. Smith Corona's ad campaigns tried to convince consumers that PWPs could do the job that they thought they needed a computer for, at a fraction of the price.

The annual Venture Development Corporation reports show that in the early to mid 1990s, competition from Japanese entries into the ET and PWP markets increased, prices declined, and margins were eroded. In consumer ETs, Smith Corona maintained its leading market share (consistently about 45%) of a shrinking market. In PWPs, Smith Corona lost its market share leadership when Brother and Canon introduced models with inkjet printing technology (in 1993). Inkjet, in contrast to printwheels, is a nonimpact printing technology that allows for faster printing, flexible fonts, and graphics.

At the same time, the distribution landscape changed. The office superstores, the electronics superstores, and the mass merchandisers were gaining strength and driving Smith Corona's enormous network of small office supply stores out of business. The number of office superstores increased from 19 in 1988 to 800 by 1993.[3]

As ETs started to decline in both size and profitability and PWPs stagnated and became unprofitable, Smith Corona started a series of entries into different office-related product categories. The strategy was to build on the strength of the Smith Corona brand and its distribution channels while sourcing products from third-party manufacturers. The first entry outside of typewriter-related products was a line of electronic reference products (a handheld dictionary, thesaurus, spell checker, and calculator), introduced in 1989. This line failed and most of the inventory was written off or given away in a promotion.

The most significant attempt to branch out from the typewriter category started in 1990, when Smith Corona announced an alliance with Acer, the Taiwanese computer manufacturer, to develop and market PCs specifically designed for the small office and home office markets. Smith Corona did software engineering to make the interface of the PC unique to Smith Corona, more user-friendly, with a start-up menu and a word processing program that was modeled on the Smith Corona PWPs. The PCs were on par with competition regarding performance and price. They were branded 'Smith Corona by Acer.' Acer allied with Smith Corona because it felt Smith Corona could help penetrate the U.S. market. After a few months they realized this was not the case; the Smith Corona brand and distribution were not helping much and sales goals were not met. For their next models, using the more advanced 486 processors, Acer dropped the alliance and introduced its own branded products. Smith Corona's venture into PCs was a failure and resulted in a loss of several million dollars. It was terminated in June

[3] U.S. Industry Profiles, Office Machines, 1993.

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1992 only nine months after the PCs had been introduced.

From 1992 through 1995, many product lines related to the office were introduced in this sequence: inkjet printers, a line of ribbons compatible with many brands of ETs, PWPs, and dot matrix printers, laminators, calculators, fax machines, home office furniture (including office chairs, desks, and desk lamps), label printers, and handheld labelers. All of these, except the labelers, were manufactured by third parties. Exhibit 1 presents a 1994 advertisement that provides a comprehensive overview of all product lines. Probably the most obscure among these products was the HandiFax, a handheld PDA-like device that could transmit text typed into its keyboard to faxes by connection to a phone, but could not send or receive paper faxes. Meanwhile, Smith Corona continued to introduce new models of ETs (until 1993) and PWPs (until 1995).

Despite these efforts, Smith Corona did not succeed in stopping its steady decline in revenues and profits year after year (see Table 1). 1993 was the first year with a loss. Most of the entries into new product categories were failures and led to losses, some were small successes, but none created sufficient revenues and profits to replace the decline in the core product category. None of the new product category entries took off in the marketplace. In 1995, sales of products other than ETs, PWPs, and their supplies represented only six percent of total sales ($11.8 out of $196.3 million).

In 1992, Smith Corona announced its decision to end manufacturing in the United States and to move its manufacturing operation to Mexico. As Smith Corona was now manufacturing abroad, and Brother was manufacturing in the United States, the companies lost legal grounding for their trade disputes. In 1994, Smith Corona and Brother in a mutual agreement ended their legal battles over dumping. The trade litigations, which had lasted two decades, were the longest in U.S. legal history.

In July of 1995, the firm filed for bankruptcy protection under Chapter 11 of the U.S. Bankruptcy Code. In 1997, Smith Corona emerged from bankruptcy and its new stock began trading on NASDAQ. The company outsourced the manufacture of ETs and PWPs and tried to transition to a marketing organization. The strategic goal developed during the reorganization was to source products that would offer solutions for the small office/home office market (SOHO). Smith Corona sourced and marketed a broadened line of office products, including cordless phones, office telephones, personal organizers, combination fax and copier machines, label printers, digital photo printers, replacement inking products, and telephone headsets and amplifiers. The company conducted a 10 million dollar print and television advertising campaign to reposition itself into 'the preferred electronics brand among the nearly 50 million potential SOHO consumers in the United States. ... The campaign ... portrays the brand as a liberating force for professionals who choose to work from home.'[4]

Post-bankruptcy Smith Corona never obtained an operating profit. The effect of operating losses on net income was reduced by continuing asset sales, such as the sale of its manufacturing operations in Singapore and Mexico, and its previous manufacturing site in Cortland, New York. These were the last remnants of its manufacturing operations. A continuing installed base of typewriters also generated a profit stream from the very high margin supplies such as ribbons, correcting tapes, and printwheels, which represented over 30 percent of sales in the last three years (1997–1999, see Table 1). In May 2000 Smith Corona filed for Chapter 11 bankruptcy protection for the second time, but this time it did not emerge. Its assets were bought by Pubco, a manufacturer of label printers and printer supplies. Smith Corona closed its doors in April 2001.

FINDINGS

The above history shows that Smith Corona was successful in transitioning within its product category, going from mechanical to electric to electronic typewriters to personal word processors. However, it was not able to transition into other categories. The company never achieved more than 11.8 percent (in 1995) of sales from products outside of typewriters and their accessories and supplies (see Table 1). Smith Corona was unable to enter a viable new product domain enabled by a new set of resources (cf. Danneels, 2002; Floyd and Lane, 2000). The findings section is organized according to the various modes by which

[4] Business Wire, 8 January, 1998.

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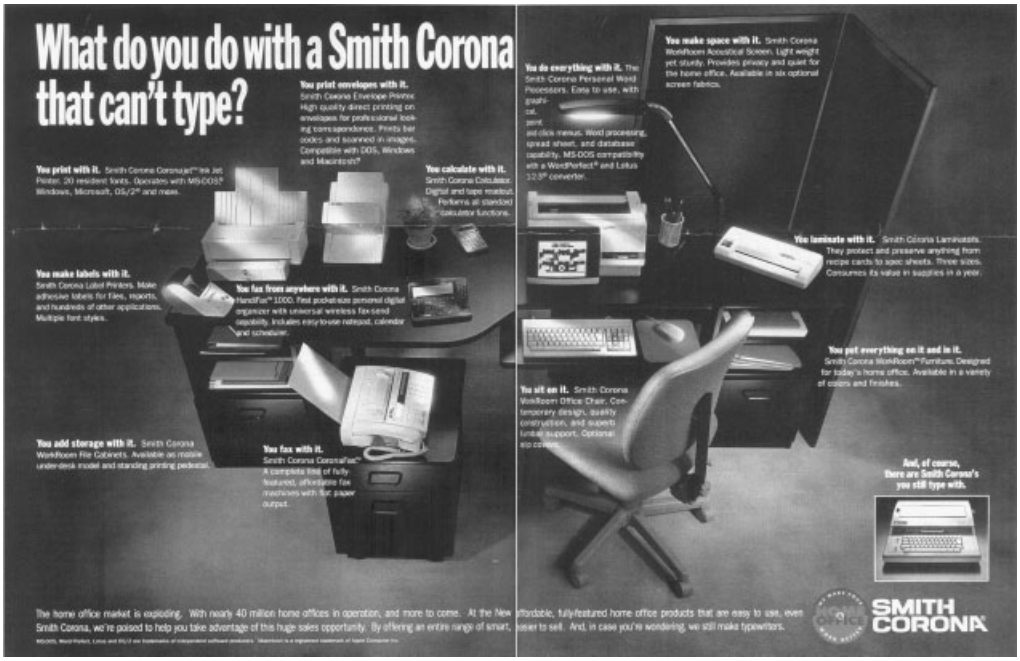
EXHIBIT 1
SMITH CORONA PRODUCT LINES IN 1994



a resource base can be altered: leveraging existing resources, creating new resources, accessing external resources, and releasing resources (cf. Eisenhardt and Martin, 2000). In addition, it develops the notion of resource cognition, which is essential to explaining the exercise of dynamic capability.

Leveraging existing resources

Leveraging resources enables a company to renew itself by drawing on its existing resources, and applying them to new uses, such as new product categories (Danneels, 2002, 2007; Miller, 2003). Penrose (1959: 25) stated that 'resources consist of a bundle of potential services and can ... be defined independently of their use.' According to Teece (1982: 45) '... a firm's capability lies upstream from the end product—it lies in a generalizable capability which might well find a variety of final product applications.' However, resources vary in their degree of fungibility and can only help new product category entry if they are fungible. As the next sections shows, Smith Corona tried to leverage its brand, distribution, and customer understandings, but these resources did not add value to the new products.

Leveraging the brand

The resource that most impacted Smith Corona's attempts at renewal was its brand. Resources have been categorized into two types: market-related and technology-related (Mitchell, 1992). Brand names are among a firm's most significant market-related resources. Smith Corona tried to leverage this market-related resource. The firm's strategy was to 'capitalize on the strength of the Smith Corona brand name in pursuing new product categories.'[5] This is a strategy of brand extension, which has been studied extensively in the marketing literature. Brand extension is 'the use of established brand names to enter new product categories' (Keller and Aaker, 1992: 35). The premise for extending an existing brand name is that customers use their beliefs about the brand to draw inferences about an extension product (Klink and Smith, 2001). Brand associations are transferred to the extension product. I argue that the Smith Corona brand, because it was so strongly and intimately connected with the typewriter category, was actually a liability in the effort to enter other

[5] Annual report, 1994.

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product categories. This contention can be supported with evidence from the case and examination of prior research on brand extension in relation to the case.

From 1991 on, as their core product category started to decline both in terms of volume and margins, Smith Corona sought to leverage its brand to many other product categories for the SOHO (small office/home office) market that they had historically served. However, none of these brand extensions was successful or garnered any significant market share. Therefore, understanding the reasons for the failed brand extensions is critical to understanding Smith Corona's demise.

I am proposing that their brand was not fungible, that is, it was not transferable to these other product categories. Theory developed in the brand extension literature helps to understand the limited fungibility of the Smith Corona brand. Three types of brand associations greatly impact their fungibility: product category associations (e.g., Smith Corona—typewriters), benefit associations (e.g., Smith Corona—easy to use), and usage situation associations (e.g., Smith Corona—home and small office). The ease of cognitive access in customers' minds of one type of association may interfere with the accessibility of other associations (Meyvis and Janiszewski, 2004). In the case of Smith Corona, the most accessible brand association was the typewriter category association.

Smith Corona tried to extend itself along each of the three types of associations. The ET and PWP entries were extensions along the typewriter category association. These were very successful as Smith Corona maintained from 30 percent to 50 percent of the market and had very high brand awareness (based on Venture Development Corporation reports). In contrast, the efforts to extend along the usage situation (SOHO) and benefit (e.g., the 'ease of use' of the Simply Smart PC) dimensions were not successful.

Smith Corona's brand name was strongly and narrowly associated with typewriters, such that this category association dominated over any benefit or usage situation associations (Meyvis and Janiszewski, 2004). The reason for the product category dominance in the brand was the accessibility of the product category association. According to associative network models of memory, stimulation of one cognitive element leads to activation of linked other cognitive elements (Anderson 1983). I suggest that the Smith Corona brand activated a product category association, which dominated over any other association. Highly accessible knowledge structures concerning the brand, held in long-term memory, dominate over less accessible associations (Meyvis and Janiszewski, 2004). Smith Corona had a century-long, historical association with typewriters, first manual, then electro-mechanical, then electronic, and ultimately personal word processors. The very strong product category association of the brand is plausible given the exposure to and experiences with Smith Corona typewriters that many consumers accumulated over their lifetime (cf. John, Loken, and Joiner, 1998). Since consumers thought of Smith Corona as a typewriter brand, the brand did not add any competitive value to the other product categories.

'When we were sourcing products, we were just handling them. Passing on the product with no value added but the name. That's all we had. There was nothing more that we could do. We couldn't make the products ourselves competitively. If you source a product you compete with the manufacturer who slaps a different name on it. And we were banking on the customers' feeling of Smith Corona as being a trusted name' (a chief financial officer [CFO]).

According to Herr, Farquhar, and Fazio (1996: 153), 'a strong category-to-brand association is both a blessing and a curse. Strongly category-dominant brands have widespread customer recognition and often enjoy substantial market share. But this strength in the parent category may also limit the brand's direct extendibility to other product categories.' The dominance of the product category association of the brand was a hindrance to expanding into other, seemingly related product categories such as PCs, fax machines, or printers. The initial extensions of the Smith Corona brand into the electrics (1950s) and into the ET and PWP (in the 1980s) were successful because these extensions were considered by consumers as still fitting within the typewriter category. However, when these category-based brand extensions were followed with the benefit (ease of use) and the usage situation (SOHO) extensions, they were rejected.

Smith Corona tried to leverage its brand to all kinds of products that they considered germane to SOHO, what they defined as their core market.

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These products included PCs, fax machines, labelers, label printers, laminators, printers, PDAs, telephones, telephone headsets, calculators, and even office furniture (see picture of many of these products in Exhibit 1). Executives describe the rationale behind the efforts to extend the brand along the usage situation:

'The logic we had was: "What's the commonality that exists between typewriters, word processors, and these new products that we're offering? Well, it's for a small office. It's for a home office. It's the little user. We're a trusted company that was there with this great product for all these years. Guess what? We're in these other lines. It all sounds good and intellectually it makes sense' (a CFO).

'When we introduced the line of PCs, the marketplace said you guys are really not a computer company, you're a typewriter and word processor company. . . . It seemed to us a logical line extension. We did some focus groups, and consumers had a fascination with this typewriter that had put them through college. We heard that over and over and over again. We felt that since they did have that trust of our brand name, wouldn't they have that same allegiance to another product with our name on it? . . . People were having difficulty with Smith Corona because they were thinking typewriters and we were selling computers. We had been known for typewriters for 100 years' (a chief operating officer [COO]).

Smith Corona had been a category leader for nearly 100 years. Hence, the Smith Corona brand was prototypical of (a good instance of) the typewriter product category (Aaker and Keller, 1990; Herr *et al*., 1996), and it was particularly difficult to extend into other product categories. If a brand is seen prototypical for a category, it is difficult for consumers to think of it in any other way (Keller, 2003).

'The name was golden then, Smith Corona became a generic name' (a director). 'What do you mean by generic?' (me). 'Well, you use the brand name to describe the entire product category. You need a typewriter, and you say Smith Corona, even though there are multiple typewriters. You say Jacuzzi, even though there are different manufacturers of spas. You say Kleenex, even if there are different manufacturers of tissue paper' (a director).

Beyond the historical association of Smith Corona with typewriters, there are various other strong arguments that support that the brand had little fungibility. First, apart from Acer, Smith Corona could not find an alliance partner: '[The CEO] was in communication with different technology companies in the Far East and in Europe, but their attitude was why waste our time and money. He was trying to say that the Smith Corona name would be a great marketing name for one of these other companies and they just didn't buy into it' (a director) 'So this is in the early '90s that [the CEO] was looking for alliance partners to get into new technology, and offering the Smith Corona brand name as a trade' (me). 'That's it' (a director).

A CFO tells of the attempt to make an alliance with a major European computer manufacturer: 'I thought we could pull off the deal that we were trying to do with [a European computer manufacturer]. We were trading for the technology, the product. They were never successful coming into the States with their name. And we thought we had the name, they had the product, so we should be able to do it. But they didn't feel, other than money, that we had very much to offer them.'

Second, in the 1990s, no firm was interested in acquiring Smith Corona. This is further evidence that the brand had little fungibility. Since the brand was tied to a dying product category, acquirers did not value it. If it had broader applicability, acquirers would have valued it since they could use it for other products:

'[A large consumer electronics firm] was the European company that I was hoping would buy Smith Corona, and they weren't interested. . . . We tried to see if some company would buy Smith Corona and leverage the name better than we were leveraging it. We couldn't get anybody to buy it' (a director).

'The company was shopped all over the world. And there was no interest' (a director).

'Certainly we tried to sell it. We couldn't. The only thing that seemed salvageable at the time was the name, and it didn't generate much interest. . . . There was no acquisition interest in its product line or its name. At that point in time, you could see that the product line was going to become extinct. And then it was just the name. PC manufacturers, distributors, they all looked. None was interested' (a director).

'During Chapter 11, we looked at people that would come in to buy the company, and none of it happened. Everybody thought they were going

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to get it for a rock bottom price' (a vice president [VP] of operations).

From the perspective of potential acquirers, the replacement supplies business was the only valuable part of Smith Corona. The large installed base of Smith Corona typewriters guaranteed a substantial, albeit declining, demand for ribbons, correcting tapes, and printwheels.

'Frankly, the people who were negotiating to buy the business were primarily interested in the aftermarket activity and not necessarily in the primary typewriter and word processing machines. ... The aftermarket was very profitable. It's the old razor and razor blade; you sell the razors at no margin, because you make 75 points on your razor blades' (a CEO). 'Exactly. People always mentioned the brand and distribution. Were acquirers interested in that?' (me). 'They had their own distribution. So they already had shelf space at most of the places that Smith Corona had shelf space. ... As I said they were primarily interested in the aftermarket' (a CEO). 'And they weren't really interested in the brand? (me). 'Well, the brand to the extent that it would sell the aftermarket products' (a CEO).

Checking my interpretation that potential acquirers did not place value on the brand, a director agreed: 'That makes perfect sense. I was a mergers and acquisitions guy, and I went in there thinking that I had something of value, albeit intangible, in the Smith Corona name. And nobody wanted to buy it. At least nobody wanted to pay for it. And maybe others saw what we didn't, which was that it wasn't worth anything anymore. So that alone is support for what you're saying. ... I remember it being a big disappointment to me that there didn't seem to be any value; they didn't want to put value on the Smith Corona name.'

Third, the lack of transferability of the brand to the PC is the most plausible explanation for its failure. The market share of the Smith Corona branded PC was very low, even though it did reach retail shelves. The product reviews of the time were positive, stating that the line had parity performance and price points, and gave it top ratings for user friendliness. A trade publication stated about the joint venture with Acer to introduce PCs: 'That venture fizzled after a year, analysts said, because retailers found little support for a Smith Corona branded PC.'[6]

[6] *HFN*, 10 July, 1995.

Leveraging the distribution

In addition to its brand, Smith Corona also tried to leverage its distribution channels. Its relationship with the traditional independent office stores was a strong resource for many decades:

'I remember going from mom and pop to mom and pop to mom and pop. They'd have cinnamon buns waiting. "Come on, get a cup of coffee and sit down, I want you to meet my wife, and we want to take your picture." Really, that was the loyalty. Because they put their kids through school selling Smith Corona typewriters. It was like it really meant something to the family' (a COO).

The changes in the distribution channels in the 1980s and 1990s eroded the value of its channel relationships. Small retailers were gradually displaced by large ones. The resource of relationships with a large network of office supply stores became irrelevant with the emergence of the mega-retailers:

'The retail industry at that time was in a big evolution, going from independent dealers to the major mass merchandisers and the category killers. ... Smith Corona had the broadest network of independent dealers. Very quickly the retail industry evolved into the mass merchandisers and category killers. They wanted to drive customers into the store with the lowest possible price' (a CEO).

Smith Corona went from serving many thousands of fragmented small office stores to serving few very large retailers: 'In the old days you would buy a Smith Corona typewriter in an office supply store in your local downtown, which sold ribbons and paper and pencils and typewriters and desks and things like that. With the Kmarts and the Walmarts of the world, and the mass volume outlets, the channels were changing tremendously' (a VP of operations).

Even though Smith Corona gained access to these large retailers, the relationships with them was a much weaker asset: 'You're like a punching bag. Every time you'd go back to Staples or Office Max or Office Depot, they'd say, "oh, by the way, I'll place that order, but we want better terms." And you'd say, "what do you mean you want better terms?" "Well, instead of paying in 30 days we're not going to pay until 60 days"' (a COO).

'One of the things that killed us with the Office Depots and the Walmarts of the world was their no questions asked returns. The return policy was a disaster. In one case, we actually got back one

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of our high-end word processor boxes with four white birch fireplace logs. Not only did we have to give full credit, we got a 15 percent surcharge plus handling' (a CFO).

'There was a lot more loyalty in the distribution channels before the big hitters came in. That loyalty eroded, particularly with the success of Walmart' (a CFO). 'So perhaps it doesn't mean as much for the Best Buys and the Walmarts that you've done business with them for decades' (me). 'If you have a product that matches up with your competitor, or is better or cheaper, then they'll stick with you. But if you don't, they won't' (a CFO).

In sum, the old distribution channel of traditional office stores eroded, and the access to large distributors offered little to draw on in renewing the company. In the press articles of the late 1980s, both brand and distribution are mentioned as key assets of the company. Notably, in the discourse of the early 1990s, mentions of the distribution relationships disappear and only the Smith Corona brand is mentioned as a key asset.

Leveraging customer understandings

Customer understandings reflect an integrated mental model of customers' identity, needs, lifestyles, and purchasing behaviors (Danneels, 2003). As such, they are a resource that a firm can draw upon in attempting to renew itself. I propose that Smith Corona's customer understandings were not of the customers in their own right, but rather of how the ET and PWP satisfied customers. Consequently, these understandings, as a firm resource, were product-specific and therefore not fungible.

The lack of deep customer understandings prevented the company from introducing products that had superior benefits. When sourcing from third-party manufacturers was pursued starting in 1989, and increasingly until the end, Smith Corona did not show evidence of a strong understanding of its customers. Such a resource could have been used to develop competitively advantaged products, that were better tailored to customer needs then competitors' products.

'There was no reason to believe that we had anything in our history or our core competencies that told us technology is the way out of this. Sourcing maybe, in a smart way, to go to somebody in Korea and say here's what the market really wants, can you make that?' (a director). 'But if you source you're not going to get access to the most innovative stuff' (me). 'No, of course not. ... The key is you have to know who your customer is, and figure out if somebody can make it' (a director).

New product category entries were not based on in-depth understanding of SOHO customers, but rather on competitive imitation: 'Unfortunately we were followers in most of those products. Brother had come out with a labeler that was extremely successful. We tried to follow that and didn't do particularly well with it. ... Likewise, the laminator was an also-ran product. ... The other products were all in response to competitors introducing those products, so we were always catching up' (a CFO).

'Nothing ever really caught on. We didn't reinvent the telephone, we didn't reinvent the fax machine, all we did was try to tag on to what was already out there, and so even though we would get into the fax machine or the laminator business, all we were doing was try[ing] to get some of that market share. ... After the typewriter, all the other products were just tagalongs. There was nothing innovative. The labeler was bought from another company, the fax machines were made overseas, and the telephones were made overseas. Everything was made by someone else' (a VP of operations).

In sum, the entries into alternative product categories required different resources than those that Smith Corona had, even though they were all office products, ostensibly targeted at customers the company was already serving. Smith Corona PCs, for example, were targeted at the same customers as their ETs and PWPs, in particular novices and technophobics. However, even though the customers were the same, they required different market-related resources to serve (see the analogous distinction between fit and familiarity in discussions of product innovativeness, Danneels and Kleinschmidt, 2001). The company's traditional distribution channel eroded, the Smith Corona brand was no longer valuable, and the company lacked the in-depth understanding of its customers to develop superior products.

Creating new resources

In the absence of existing resources to leverage, building or creating new resources might have altered the resource portfolio and presented another

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mode of dynamic capability. Together, these bundles of resources form a new competence (Grant, 1991; Helfat and Peteraf, 2003), the ability to do new things. Following Eisenhardt and Martin (2000), this is the second mode of dynamic capability. The development of new competences, constituted by a set of new resources, requires a second-order competence (Collis, 1994; Danneels, 2002, 2007, 2008; Winter, 2003). A second-order competence is a competence at adding new competences, that is, a competence at explorative learning (Levinthal and March, 1993; March 1991).

During the focal study period, Smith Corona created a new competence only once when it assembled resources in electronics, such as a lab and engineers. Smith Corona did not try to serve non-office markets during this period. Therefore, it did not exercise any marketing second-order competence, that is, it never built market-related resources to enter new markets.[7] Therefore this section focuses on the company's second-order R&D competence. Technological competence consists of such resources as engineering know-how, manufacturing facilities and know-how, and patents. Building a new technological competence involves identifying promising technologies, hiring engineers in new areas, setting up new development and production facilities, and so on. Second-order R&D competence is a competence at exploring new technologies and adding new technological competences to the firm's repertoire (Danneels, 2002; Levinthal and March, 1993; March, 1991). Smith Corona hired new engineers, established an R&D facility, set up new manufacturing operations, and at great effort and cost added a competence in electronics.

'We had an engineering office in Newtown, Connecticut [close to Danbury] at that time and there were all these electronic engineers. The product engineering was done there, in a whole separate environment. . . . When they started they brought in an electronic engineer. He headed up that group that developed that first electronic typewriter' (a VP of operations).

The technological competence in electronics enabled the company to develop ETs and later PWPs. The extensions into ETs and PWPs leveraged Smith Corona's brand and distribution and required a new technological competence. Because they drew on an existing competence to serve particular customers while requiring a new technological competence, these new products are of the 'customer competence leveraging' type (Danneels, 2002). Customer competence leveraging is a combination of exploitation of an existing customer competence (the ability to serve certain customers) and the exploration of a new technological competence (the ability to use a technology to physically make something). The difference between the entries into ET and PWP and the entries into other non-typewriter categories is that the former could leverage the company's market-related resources whereas the latter could not.

In the late 1970s, Smith Corona started the development of the ET. Although the transition was costly and took several years, it was eventually successful. Smith Corona designed integrated circuits and put the software on them to provide functionalities beyond the traditional electric typewriter.

'About 1978 they really started looking at the electronic typewriter and so I spent a few years working in that arena. The transition from a mechanical electric typewriter to an electronic typewriter was a huge undertaking. It reduced the amount of parts in a typewriter from about 3,300 down to about 400. So everything was basically completely redeveloped. . . . Most of Smith Corona's engineers were mechanical engineers and so the first thing that really had to happen [was] some electronic engineers had to be hired. . . . And so the transition was not just hiring new electronic engineers and getting them to work close[ly] with the mechanical guys, but the entire manufacturing process had to change and new equipment had to be purchased: things like equipment that would insert diodes and resistors into printed circuit boards and a soldering machine to solder the bottom of the board' (a VP of operations).

The manager of manufacturing engineering stated in the company newsletter:

'Within our department we are fortunate to have a number of dedicated employees covering disciplines including die castings, plastic molding, sheet metal fabrication, heat treating, and product

[7] It should be noted that at times Smith Corona did serve two distinct market segments: offices and SOHO, although it was always more successful in the latter segment. In the focal period, the only product introduction that was distinctly targeted at non-SOHO was the Typetronic, its first ET, which obtained a very small market share.

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assembly. The more recent transition to the Typetronic family of electronic typewriters required the acquisition of new technical personnel to support the electronics assembly and testing operations. . . . The introduction of electronic products has created a challenge to this group to evaluate and implement the most up-to-date technology.'[8]

'A mechanical engineer could have never developed the personal word processor. The company's whole focus changed in the 70s and 80s. People from all over the United States came to work for Smith Corona out of college and from electronic firms. We brought in the best of the best that we could recruit into Smith Corona. Then we needed manufacturing people to come in to make and test the boards. We needed to bring in new blood' (a VP of operations).

No new resources were created after the mid-1980s when ETs and PWPs were developed. Technological work was focused on refining the features and manufacturing of the ETs and PWPs. In other words, it was exploitative (Levinthal and March, 1993; March 1991). Smith Corona stopped technological exploration when the R&D facilities in Connecticut were closed down in 1982.

'At one time engineering and manufacturing were separate organizations reporting to the chief executive of the division. But [the CEO] combined those positions somewhere in the early '80s. . . . Eventually they closed the Newtown engineering facility and combined it up here' (a VP of operations).

Smith Corona did not develop any new technology after the electronics that enabled ET and PWP products. The annual reports mention that the company had no significant patents. 'Before I got to Smith Corona, they had developed some pretty interesting products. They developed a spell-checker. They developed a really mean line of electronic typewriters. And when I got there, I was looking around, saying, where are all the people that were designing all this great stuff I've seen over the years? And I couldn't find them' (anonymous at request).

The remaining R&D and engineering became focused on improving the functionalities of the existing two product lines. Virtually all of the R&D spending noted in Table 1 was focused on ETs and PWPs. Asked about the kind of R&D conducted at the plant in Cortland, the VP of operations said: 'It was mainly focused on engineering that could be tied to the electronic typewriter or PWP business. It was an extension, really, of that. That was their primary focus, to continue to develop, especially software that could be used to incorporate additional features that people wanted in word processing. . . . I don't recall a budget number, but there was not a large part of the engineering budget that went to R&D. Most engineering was tied to the advancement of the PWP.'

From the mid-1980s on, R&D at Smith Corona was almost entirely exploitative, apart from some minor and failed efforts to develop faxing and printing technologies. 'A lot of the money went to continually trying to redesign the typewriter and word processing line, to get cost out. . . . The R&D function was really part of manufacturing, that's why that money would be spent to refine product and get cost down. . . . But it never tried to develop unique technology' (a VP of product development).

'There were people up at the plant that were doing some level of research and development, but there was never much of an effort, there weren't that many people, there wasn't that much money. I would have heard more about it. You're talking about a handful of engineers' (a director.). 'Well what you see is that the products kept improving incrementally but you don't see anything really new coming out' (me). 'Right, right' (a director).

Because Smith Corona did not develop any competitively distinctive technologies, its entries into alternative product categories were me-too products. They were sourced from third-party suppliers and private labeled. Smith Corona had no distinctive or propriety technology that could enhance the functionality of these offerings.

'We really had nothing to offer. It was a highly competitive marketplace and we had no leg up. From my point of view we had two things going for us, brand name and distribution, and one fed on the other' (a CFO).

I examined the lack of financial resources as a reason for the lack of second-order competences in the focal study period (1980–2001). Having financial slack, such as low leverage and high current ratio, allows a company to take on debt to invest in building new technological and market resources (Nohria and Gulati, 1996). At Smith Corona, the current ratio was stable, whereas the debt load actually declined after the IPO in 1989

[8] Company newsletter, September, 1982.

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(see Table 1). Smith Corona did not use its financial slack to alter its resource base. Even though financial slack was available, Smith Corona did not invest in building new technological or market-related resources. In an interview with the CFO of the time, I asked whether the dividend payment and the debt burden after the IPO may have put a damper on what the company could do to adapt to the disappearance of its product category:

'Is there a connection between the financial constraints and a lack of innovation? (me). 'There I may be the wrong guy to talk to, but I don't think so. I think it was failure of vision, management vision' (a CFO).

Indeed, a lack of 'vision' led to a paradox of lack of second-order competence and resource allocation: because there was no vision of what specific resources needed to be accumulated, there was also no request for funding (cf. Danneels, 2007). 'I believe that if Hanson [the majority owner] had said you can have a huge amount of capital from us if you want it, it would not have made a difference. . . . I never heard [CEO] say "if we just had a little more money for advertising or if I just could hire some more engineers, everything would be okay"' (a director). 'I kept thinking that management needed to go to Hanson and say, here's what we need and here's what we're going to do, and they never did' (a director).

'I don't think the company was ever investment starved. There are people who might say we should have been spending a lot more money on R&D to come up with the next idea. Even looking back 15 years, I still don't know what that idea would have been' (a COO).

Accessing external resources

Another way to change the resource base is to access new resources from outside the firm. Indeed, rather than build new resources on its own, Smith Corona relied on partnerships to enter the product categories outside of typewriters. Alliances and acquisitions are two ways that a firm can access other firms' resources (Das and Teng, 2000; Eisenhardt and Martin, 2000; Harrison *et al*., 2001). When trying to leverage its brand and distribution, Smith Corona relied on alliances with suppliers to access the complementary technically related resources. Arguably the most crucial of these was the alliance with Taiwanese PC-manufacturer Acer to introduce Smith Corona branded PCs into the U.S. market. In 1990, Acer and Smith Corona started the alliance intended to combine their complementary resources (cf. Harrison *et al*., 2001; Kale, Dyer, and Singh, 2002). Acer wanted to use Smith Corona's brand and distribution resources to get access to the U.S. market, and Smith Corona wanted to gain access to the technological competence of Acer to design and manufacture PCs.

'For Smith Corona to survive, we had to do something to marry up with a technology company. One way or another we had to get PC technology into the company. . . . One of the strengths we had with Smith Corona was the distribution network and the relationship with the large retail outlets' (a CFO).

'Acer was to develop the product and we were to market it. . . . I felt, and there may have been others that shared that feeling, that we were adding validity to the Acer name by tying in Smith Corona. . . . Again, I, and perhaps others, felt that we were lending credibility to go into these retailers because of the fact that Smith Corona with fifty plus share market in typewriters and word processors has chosen Acer to partner with. We were a credible supplier' (a VP of marketing).

Complementary resources can generate new value if pooled across firms through an alliance (Das and Teng, 2000; Harrison *et al*., 2001). However, as discussed, the Smith Corona brand name did not add value in the PC product category, and the sale of the PCs was poor. After less than a year, Acer terminated the alliance and introduced its more advanced models using the 486 microprocessor under its own name.

The reliance on alliances to gain access to external technological resources continued until the end of the firm. In a memo section entitled 'Strategic Alliances—Our Technology Infrastructure' a CEO states that after its Chapter 11 filing, Smith Corona needed to rely on alliances to engage in product development: 'Plain and simple, we could not afford to continue funding internal design and development activities. The alternative to "in-house" design and development, in the short-term, is, of course, partnering for product, product design, and product development.'[9]

Acquisitions were impossible for Smith Corona because of lack of financial resources.[10] 'For Smith

[9] Company memo, 1997.

[10] In 1974, Smith Corona began a 20-year legal battle against Japanese typewriter manufacturers, in particular Brother. Even

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Corona to do an acquisition, they didn't have the balance sheet or the financial credibility to get the financial backing to do that' (a director).[11]

In sum, external resources did little to renew the company as it had no valuable internal resources to complement them with. Smith Corona faced 'the most fundamental irony of alliancing: firms must have resources to get resources' (Eisenhardt and Schoonhoven, 1996: 137).

Releasing resources

The last mode of exercising dynamic capability—the shedding or dropping of resources (Eisenhardt and Martin, 2000; cf. Harrigan, 1980)—was what sustained the company in its last decade. At various points, Smith Corona tried to make its operations more efficient by laying off employees and moving manufacturing abroad. The workforce reduction in 1984 had a notable effect on the turnaround to profitability starting in 1986 (see Table 1). The move of manufacturing operations to Mexico, however, was less successful. By some estimates it seems that the expense of the Mexico move exceeded the cost savings, particularly if one considers that the estimate of cost savings used by executives at the time of the decision in 1990 was a function of their forecasts of future sales. This interpretation is supported by the fact that the Mexico facility had twice the needed capacity when finally completed: 'We had two production facilities: one in Singapore and one in Mexico. And neither was up to 50 percent utilization' (a CEO).

The move took over three years to be completed, and some of the skilled labor force (such as in tool making) was unavailable at the selected location. 'Moving the plant to Mexico was a great move, because it was $18 or $19 or $20 per hour for labor fully loaded up in Cortland, New York, and we went down to about 75 cents an hour. But you couldn't save your way to survival because there weren't enough ways. So low-cost manufacturing really wasn't the issue. It was a top line issue' (a COO).

In 1997, this manufacturing operation was sold to a contract manufacturer: 'We sold off the manufacturing facility in Tijuana because of the decreasing demands for the product. We had excess plant capacity, so therefore our per unit cost was just skyrocketing and so we ended up selling the facility to a contract manufacturer who buys facilities and serves in a contract manufacturing role to a lot of different people' (a CFO).

The divestment of manufacturing assets sustained the company for its final years. While the company never obtained an operating profit after 1994, it does show a positive net income in 1997 as a result of the divestment of assets (see Table 1). It is important to note that none of these divestments redirected resources into alternative uses that could lead to organizational renewal. Instead, they were used to sustain an ailing operation.

Ironically, the same typewriter business legacy that hampered its renewal, helped sustain the company until the very end. An important share of Smith Corona's sales came from supplies and accessories for ETs and PWPs, which in the last few years were over 30 percent of total sales (see Table 1). 'The company's installed base of typewriters and personal word processors, consisting of an estimated 20 million units, results in a substantial accessories and supplies business.[12]

'One of the things that was very important and was a huge draw to continue in the typewriter field was the aftermarket profits you make from ribbons, printwheels, correction tapes, and so forth. You sell an electronic typewriter every two or three years to an individual, possibly. But if that product is used a lot, which they were, the volume of these aftermarket items [becomes] enormous. Like the old-time safety razor. You sold the razor for a dollar, but you made all your money on the blades. . . . There was a reluctance to give that up, because it was always a very good business' (a VP of operations).

'People were burning through the ribbons. And the ribbons were 50 percent, 60 percent, 70 percent gross margin items for the company' (a COO). It was this supply business that represented the last valuable Smith Corona asset, the only asset that potential acquirers were interested in.

though the trade and dumping legal battle diverted some financial resources and managerial attention, the decrease of slack from this effort did not seem to have a large effect.

[11] The firm did make a few minor acquisitions in the office supplies area.

[12] Prospectus for the IPO, 1989.

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Resource cognition

To understand the ways in which managers might try to exercise dynamic capability, it is essential to consider how they conceptualize the resources of their company. The extended case study of Smith Corona reveals that this is a gap in current theorizing about dynamic capability; how and to what extent dynamic capability is exercised depends on executives' cognitions about their firm's resources. Managerial resource cognition helps to explain which paths firms do or do not take. As the Smith Corona case demonstrates, the cognitions may not concur with the resources' actual nature, and may lead managers down unfruitful paths.

Resource cognition refers to the identification of resources and the understanding of their fungibility (cf. Denrell, Arvidsson, and Zander, 2004; Marino, 1996) and results in resource schemas. A 'resource schema' is the mental model that managers hold of their firm's resources and contains answers to questions such as 'what are our resources?' and 'what are the potential applications of our resources?' It is the result of a subjective process of self-conscious inquiry and requires viewing resources in their own right, as distinct from the products in which they are embedded (Danneels, 2002; Hamel and Prahalad, 1994; Teece, 1982; Wernerfelt 1984). This concept builds on extensive work in cognitive psychology and managerial cognition. A schema is 'a cognitive structure that represents organized knowledge about a given concept or type of stimulus' (Fiske and Taylor, 1984: 140). Acting as guides for action (Stubbart, 1989), schemas are aids to sensemaking of the environment and drawing inferences. Managers construct these belief structures to simplify their representations of their world and facilitate decision making (Walsh, 1995; Stubbart, 1989).

Smith Corona managers' schemas about two resources—their brand and their customer understandings—impacted the way that they tried to exercise dynamic capability to renew the firm. First, Smith Corona executives identified the firm's brand and distribution as key resources, which was reduced to just the brand in the early 1990s. The managers' belief that the brand was the firm's key resource set the avenues of renewal that they pursued. Smith Corona tried to leverage its brand to new product categories, but not its manufacturing skills and equipment. In fact, my interviews confirm that this option was never even considered. Instead, they increasingly divested these manufacturing assets. Interestingly, their long-standing competence in mechanical assembly, and more recent competence in assembly of electronic components, might have proved valuable in other applications.

The Smith Corona managers' conceptualization of the brand did not recognize its lack of fungibility. Penrose (1959) made a distinction between the firm's resources and the services those resources can render. This study shows that there may be disconnect between the services that resources can actually render, and what managers think they can render. None of the printed evidence contemporary to the entry into the other product categories, nor any of the interviews, suggest that Smith Corona managers appreciated the limited fungibility of the brand.

'When you reorient, first you identify the resources that you have, and then you think about their fungibility, as economists call it, to what extent are they applicable to different uses' (me). 'We never looked at it that way, and that's an oversight. We looked at it and said: it's a very, very powerful brand' (a CEO).

Smith Corona managers evaluated their brand extensions on the basis of product similarities, for instance, printers and faxes are similar to typewriters because they also put ink on paper, they are used in offices, they serve to communicate through printed words, and so forth. '[The CEO] felt that the Smith Corona name was recognized throughout all American households and would be a great marketing name for any other product' (a director).

'If somebody was willing to spend $2,000 or $3,000 or $4,000 for a PC made by some guy named Dell, I mean there was no history to that name, why wouldn't they buy a product that had some history? At least you could say I know these people from the typewriter business. There's brand loyalty. They make a quality product. They stand by their product' (a CFO).

Meyvis and Janiszewski (2004) found in their experimental studies that simple similarity-based evaluations of brand extensions are erroneous. Instead, consumers evaluate brand extensions by relying on the most diagnostic and accessible associations that they have of the brand. The actual fungibility of the Smith Corona brand was much lower than believed by managers. Because executives misunderstood the nature of their brand as

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a resource, they made erroneous inferences about entry into other product categories. They did not recognize that the resources necessary to succeed in alternative product categories were distinct, in spite of superficial product similarities. For example, they did not see that computers required different market-related resources and regarded the PC as a straightforward product line extension: 'The company's new line of Simply Smart personal computers is a logical evolutionary extension of the core products in text and information processing.'[13] When asked about the transition from ET to PWP, the CEO of the time expands: 'And then from word processors to computers, again it's not a big step.' I then asked 'for the consumers or for the company?' and the CEO replied 'for the company and the consumers.'

Similarly, regarding its entry into fax machines, a Smith Corona press release stated: 'Leveraging its strong brand name and distribution network, Smith Corona has introduced ... fax machines for the home, home office and small office markets. Fax is a natural new product category for Smith Corona because we understand paper handling, print handling and person-to-person communications from our leadership in the electronic typewriter and word processing markets,' said (disguised) vice president of new product development. ... The fax product is the newest member of Smith Corona's expanding product line, making Smith Corona the leading provider of home office solutions.'[14]

Upon trying to emerge from the 1995 bankruptcy, the same lack of appreciation for the limited fungibility of the brand held. The company tried to position itself as the SOHO solution supplier: 'We talked about how we could extend into other products. The plan we had of extending into other areas of the small office, home office environment, everybody bought into it. Everybody could logically make that extension and so that's what we based it on and it just didn't take. ... When we put our plan of reorganization together, our CEO had conversations with [the next CEO] about different product offerings, and [the next CEO] said "I've got some connections overseas for sourcing. We could use the name and go into the same distribution channels. You know, it's the same distribution channel and it's now using our name as an extension to different products," but it just didn't stick' (a CFO).

Interestingly, Smith Corona failed to learn from its pre-bankruptcy failed brand extensions experiences. A post-bankruptcy CEO stated: 'Our obvious concern, going forward, is the status of our brand image, and its prospects for use in connection with new categories of products. ... Smith Corona still continues to be favorably perceived with regard to quality, reliability, dependability, and as an established company. These perceptions [are] evoked from our legacy as the "typewriter company." ... We've got to bridge the gap from our "typewriter legacy" and carry the positive images from that product and era to new evolving technology products.'[15]

The idea of extending the brand to office products continued until the demise of the company. A post-bankruptcy CEO described his strategy for revitalizing the company in the following exchange: 'What did you think were the options at that time to make the company survive? (me). 'We did a brand audit and brand recognition was very high. We had a sunset product, but the brand was very strong. So we said we've got to redevelop the brand and make it transfer outside of this product constraint. Hence, the SOHO approach. ... Smith Corona has been around for a long time, it's a very trusted name; let's translate that into "if you trust it for the typewriter you can trust it for small office, home office solutions." So it became a process of creating a brand that would translate into more than just one product' (the CEO).

In a memo to the current CEO, a future CEO stated his thoughts about the emergence of the company from Chapter 11: 'The brand equity is still strong. ... It is easily transferable to computer/IT products.'[16]

The same CEO stated in a press release: 'The size of our distribution network and the value of the Smith Corona brand name will be maximized by the marketing of new, technologically advanced products for the small and home office. These products will enable Smith Corona to counteract the continuing shrinkage in the typewriter and word processor market worldwide.'[17]

In fact, a pre-bankruptcy director proclaimed regarding the post-bankruptcy strategy: 'I may be

[13] Annual report, 1991.

[14] Business Wire, 29 September, 1993.

[15] Company memo, 1997.

[16] Company memo, 1996.

[17] Business Wire, 8 September, 1997.

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wrong but my view from the outside is that second shot was the first shot all over. Am I right?' (the director). 'Yes' (me). 'That's why I wouldn't stay around, because I was convinced that I had read this novel already. . . . Sorry, I won't buy it, so I'm out of here' (the director).

The last filed annual report stated: 'The company continued to refine its business plan, which calls for the expansion and diversification of its product lines with a renewed emphasis on building on the market's recognition of the Smith Corona brand in printed document and data transmission products.'[18]

The second perception that impacted the way that managers tried to exercise dynamic capability to renew the firm was their belief that their understanding of their customers was a key resource. This belief was faulty; they thought they understood their customers deeply, but they did not. As discussed earlier, a company's understandings of its customers is also a resource (Danneels, 2002). The attempts to enter new product categories were delayed by the dismissal of the PC as a product that would substitute the ET and PWP. The lack of deep understanding of customer needs led the company to ignore product categories (PC hardware and software) that offered alternative ways of satisfying these needs. Customers' needs motivate them to seek certain benefits of products, and, hence, what utilities they give to various aspects of product performance (Danneels, 2004). If new technology makes possible a new product category with superior or distinctive benefits that provide incremental utility that justifies a price differential, the new product category will substitute the current product category (Adner and Levinthal, 2001). Smith Corona managers did not appreciate that even though PWPs and PCs were different product categories, from the perspective of the benefits they provide to customers they were substitutes (Danneels, 2004, 2006). This led to the dismissal of the PC as a competing product category.

'At the electronics shows you could see the advancement of computers. [The CEO] always took the position that computers were too expensive, too bulky. He said: "No, that's not a competitive product to what we're doing. We, Smith Corona, are making typewriters for the home, small business, student market." That was where he felt his forté was. I used to argue with him. I said this is the future. He said, "No, no, that's a different market." He always felt PCs were going to be a different market and that he would have his niche with the home user, the small business and the students' (a director).

In the mid to late 1980s decision makers at Smith Corona dismissed PCs as being too high priced and too difficult to use to be competition for typewriters. 'I remember a statement by an executive who said: "people will always want a typewriter. PCs will never be price competitive with typewriters"' (a director).

Other evidence of the lack of deep understanding of customer needs is the repeated reference that statistics showed that 80 percent of the people that used PCs used them for word processing. 'We were selling a product at $499 or $599; PCs were selling at three times that, so we had a decided price advantage. And we firmly believed that the PWP was solving the needs of our customers' (a VP of marketing).

The CEO at the time repeated on several occasions that PCs would not obsolesce ETs and PWPs: 'Many people believe that the typewriter and the word processor business is a buggy whip industry, which is far from true. . . . Our core market, which is in typewriters and word processors, will continue to be strong. . . . A growth opportunity is certainly going to come in word processors, which is a great cost alternative to a personal computer. . . . The word processor will emerge as a winner and also we can't count typewriters out.'[19]

The VP of marketing at the time expressed the following in an interview: 'How do you see a product like the Personal Word Processor competing with low end PCs?' (interviewer). 'From our perspective the typical personal computer represents complete overkill for home word processing needs; it's far more horsepower than you need to accomplish the task at hand. The same is true for the expensive high-end electronic office typewriters. What's paramount for us, besides affordability, is ease of use and ease of learning' (VP of marketing).[20] And again, in 1989 he stated: 'Nearly 75% of the people who own PCs today use them strictly for basic word processing. The computers have a ton of other capabilities that they're

[18] 10K, 1999.

[19] Wall Street Transcript, 23 November, 1992.

[20] Consumer Electronics, June 1986.

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just not using. It's like hunting a rabbit with a canon.'[21]

Smith Corona commissioned a survey of home PC users, and shared the results in a press release, in which the VP of marketing stated: 'The survey provided us with valuable insight into the usage habits of PC users, and illustrates that the needs of most PC users can be met by a personal word processor equipped by our CoronaCalc spreadsheet, at a significantly more economical price. Our personal word processors are an intelligent alternative to PCs.'[22]

In fact, in a 1989 advertisement, Smith Corona used the headline that its word processors were 'an intelligent alternative to the personal computer.' I asked the same person for clarification of another finding from the survey:

'You quoted a survey of PC owners that showed that 10 percent use their PC only for word processing, so that means 90 percent of them are looking for something else in addition to word processing. To me that implies that if you give PC users a word processor, only 10 percent can do what they generally do' (me). 'I think what the survey says is that 10 percent of the people used their PCs only for word processing, nothing else. So people were using PCs for things other than word processing' (a VP of marketing). 'Right. To me that means that 10 percent of people who have a PC, use it only for word processing. So you'd say to them why don't you guys have a word processor, it would cost you a lot less? But that's only 10 percent of PC users?' (me). 'Correct.' (a VP of marketing). 'There's 90 percent of that market that wants something more than a word processor' (me). 'They want a PC. ... And that's why in 1989, we began to look at getting into the PC business' (a VP of marketing).

These statements show a poor understanding of the differences between the product categories and the different benefits they provide, which in turn results from a shallow understanding of customer needs. Due to this lack of in-depth customer understandings, Smith Corona's managers did not recognize that PCs could potentially address their customers' needs. They did not keep track of the trajectories of performance and price (cf. Christensen, 1997; Dosi, 1988) of PCs because they dismissed them as a totally different product category that would not invade their market. Smith Corona ignored the improvements in PCs, as they became more user-friendly and hardware prices declined. PCs offered the unique benefit of allowing the installation of additional software, and overcame their inferiority in the ease of use benefit. There was a gradual evolution in the price and the functionality of the PC. In 1990, a major shift in functionality occurred with the introduction of Windows 3.0, which made PCs much easier to use. This time point can be noted on Table 1 as the first onset of Smith Corona's decline. Another major shift in functionality occurred around 1996, when the Internet became prevalent. This added unique benefit to PCs as interfaces with the Internet, but it dealt the final blow to Smith Corona.

'No indications in the marketplace at that point in time suggested that the PWP wasn't going to continue for a while to be a very viable product. ... We firmly believed that the PWP was solving the needs of our customer at that point in time.' (a VP of marketing). 'None of us ever saw the evolution but we did recognize that you could take a computer and type with it and print it. But [the CEO] just felt it was just not price competitive and it was not designed for the home and small business at that time. Little did we know in a few years it would be, as it got smaller and more affordable' (a director). 'I don't know that we knew enough about the PC market per se, understood the dynamics of this new market that was forming, the PC market. What is the obsolescence factor? What are the demands? What are people willing to pay for? What do they want? What are the features? What are the functionalities? What is the technology and are we on the leading edge of the technology curve? I don't think Smith Corona really understood it because it was a brand new arena for us. ... It took 100 years for the typewriter to run its course and probably within the course of 12 months the PC industry underwent more technological changes than the typewriter did in 100 years' (a CFO).

In sum, managerial cognitions about two key market-related assets, brand and customer understandings, influenced how the firm tried to exercise dynamic capability, which avenues of renewal it pursued, and which it did not. While the belief in the fungibility of the brand led the company to try to leverage this resource, these repeated

[21] Adweek's Marketing Week, 2 October, 1989.

[22] PR Newswire, 9 January, 1990.

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attempts were futile as the brand was not extendable to another product category. In addition, the failure to recognize the limitations in their customer understandings led the Smith Corona managers to dismiss the substitution of their core products and made the creation of new resources seem unnecessary.

From this evidence it is clear that there was little learning over time, and inaccurate mental models persisted (Barr, Stimpert, and Huff, 1992). There are two plausible reasons why the faulty resource cognitions regarding the brand and customer understandings were not corrected as Smith Corona accumulated failed experiences over more than a decade.

First, the contradictory evidence was difficult to interpret. Failure is associated with more attributional ambiguity than success (Kruger and Dunning, 1999), and this contributed to the resistance of the resource schemas to updating. Indeed, alternative reasons for failed product introductions, in particular the alleged unfair pricing practices of competitors, were prevalent. Erroneous attribution may be the reason why the transferability of the brand was never questioned, even after many failed brand extensions. It is noteworthy that there was essentially no change in the belief that the brand was the resource that would enable renewal, but that consideration of the distribution network as a resource was deleted. Extensive cognitive processing was necessary to infer lack of fungibility from failed brand extensions and the lack of interest of potential alliance partners and acquirers (cf. Fiske and Taylor, 1984). In contrast, the closing of the small office stores and the antagonistic relationships with big retailers were concrete and vivid, and it was easy to infer that the distribution resource could not be the basis of renewal (cf. Barr *et al*., 1992). Second, due to lack of constructive conflict among top management and the board, the faulty mental models were not challenged (cf. Amason, 1996; Danneels, 2008; Finkelstein and Mooney, 2003; Jehn, 1995). The contrasting beliefs between the CEO and the board members were not explored, as the CEO did not tolerate dissent. There are hints in the interviews that the 'powerful personality' of the CEO prevented his view from being challenged, leading to a lack of 'upward voice' (Detert and Edmondson, 2006), as this poignant quote suggests:

> '[The CEO] in the late '80s was saying no, the computer industry is totally different from Smith Corona. He would not acknowledge that relationship at that time' (a director). 'And neither did any of the board members or other top management team members?' (me). 'I remember arguing with him that computers are the future. He said: "No, no, no, you don't understand; our market is this, and this is where we are successful, and this is where we are recognized." He was adamant. I'll never forget he was yelling at me. He had that strong of an opinion (a director). 'How about the other folks on the top management team? Did they have a dissenting opinion?' (me). Not really, no. If they did, they didn't express it to me. [The CEO] ran that company with very tight reins' (a director). This lack of constructive conflict allowed inaccurate resource cognitions to go unquestioned and unexamined, in spite of mounting disconfirming evidence (cf. Schulz-Hardt *et al*., 2006).

DISCUSSION

The decline of its core product category challenged Smith Corona to exercise dynamic capability, that is, to alter its resources in order to enter into other product categories. This study examined how the firm used the various modes of resource alteration: leveraging, creating, accessing, and releasing resources (cf. Eisenhardt and Martin, 2000). The firm was not able to alter its resources to offer competitively viable new products.

The purpose of this study was to advance dynamic capability theory by confronting it with an empirical case. This study has done so in several ways. First, by untangling the modes of alteration of a resource base, it helped to open to the 'process black box' of dynamic capability theory. This study has provided a rich understanding of the modes of resource alteration, in other words, *how* dynamic capability enables renewal. It has also provided insights based on managerial cognitions into *why* various modes are used. Second, this study related dynamic capability to other areas of conceptual and substantive inquiry. Some of these have been explicitly related to dynamic capability (e.g., alliances and product innovation); others have heretofore not been considered part of the purview of dynamic capability (e.g.,

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brand extension, resource fungibility, and managerial cognition). Third, it showed relationships among concepts that are relevant to understanding dynamic capability but that have remained unconnected in disparate literatures, such as the work on brand extension in marketing and the work on resource fungibility in industrial organization economics. Fourth, it empirically grounded the rather elusive dynamic capability theory (Barr, 2004; Kraatz and Zajac, 2001) through examining in great detail how a firm managed its set of resources in the face of the decline of its main product. Making empirical referents explicit will, I hope, help to develop consensus about the meaning of key concepts in dynamic capability theory. Fifth, this study revealed a gap in current dynamic capability theory, namely that it is necessary to consider managerial resource cognition in order to understand the actual or potential exercise of dynamic capability. It is not only resources that affect dynamic capability but also cognition about those resources.

The next paragraphs will elaborate the implications of the most important contribution of this study: the development of the concept of resource cognition. Understanding resource cognition is critical to advancing the theory of dynamic capability. Resources cannot be assumed to be a given to managers. As Barney and Arikan (2001: 174) stated, 'resource-based theory has a very simple view about how resources are connected to the strategies that a firm pursues.' The actions necessary to manage resources are not self-evident (Barney and Arikan, 2001); they are contingent on managerial cognitions. Managers' cognitions about their firm's resources affect which directions of resource renewal are pursued. I proposed the concept of 'resource schemas'—mental models held by managers involving the identification of firm resources and the understanding of their fungibility. So far there has been little study of managers' conceptualizations of resources and competences. Future research could examine the process of resource cognizing: how does a company come to understand what its resources are and what alternative uses could they be put to? While fungibility may be obvious for some resources, such as a plant that can only produce one particular product, it is much more subtle in the case of other resources, such as brand. How does a company know what it is good at or which of its resources are still valuable in a changed environment? Little is known about how or how well managers understand their own resources and competences (Denrell *et al*., 2004), despite the fact that the identification of resources and competences has long been considered a cornerstone of strategy (Andrews, 1980). In their recent conceptual article, Schreyögg and Kliesch-Eberl (2007: 928) suggest that 'organizations often lack a well-articulated understanding of their own capabilities.' In parallel with individual level research on meta-cognitive competence—the ability of individuals to assess their own competences, skills, and knowledge (Kruger and Dunning, 1999)—research regarding organizational self-cognition about resources and competences could be very fruitful. Research on managerial cognition about resources would extend prior studies of the role of managerial cognition in firm renewal (e.g., Barr *et al*., 1992; Kaplan, Murray, and Henderson, 2003; Tripsas and Gavetti, 2000).

There is minimal theory explaining how firms manage resources to create value (Sirmon, Hitt, and Ireland, 2007). Understanding managerial cognition about firm resources helps fill this gap. For managers, resource cognition is essential to the exercise of dynamic capability. Active management of the resource base requires accurate understanding of the nature of the resources. This is far from a trivial task (Coyne, Hall, and Clifford, 1997; Marino, 1996; Narayanan and Kemmerer, 2001). Contrary to managers' beliefs, the Smith Corona brand had limited fungibility. Its redeployment to other office products was unsuccessful, in spite of the fact that those products had surface similarities with the firm's historical core category of typewriters. This call for a more reflexive approach to resources is in tune with recent conceptual work on dynamic capabilities. Schreyögg and Kliesch-Eberl (2007: 913) proposed 'capability monitoring' in order to achieve explicit self-awareness. Teece (2007: 1341) stated that 'use of the assets the enterprise owns involves knowing the fine-grained structure of the firm's asset base.' Clearly, the active and purposeful management of resources, or resource 'orchestration' (Teece, 2007: 1320), requires valid cognitions about those resources.

It should be emphasized that a single firm case study cannot demonstrate the relationship between dynamic capability and success in dealing with environmental change. Because a declining product category was the core of its business, Smith

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Corona's need for renewal was more pronounced than it would be for a firm active in a portfolio of product categories. This makes Smith Corona an especially appropriate case to study dynamic capability (Strauss, 1987), as it made many attempts to alter its resource base in order to enter product lines other than ETs, PWPs, and their accessories and supplies.

Despite its limitations as a single case study, some managerial implications can reasonably be drawn. First, a firm wants to exercise dynamic capability to achieve renewal needs to start with an honest self-assessment of its resource base. Firm executives need to identify current resources and competences and assess their fungibility. Two focal questions should be addressed: what are our key resources and competences, and what is the range of their potential uses? The answers to these questions should be enriched and vetted by frank debate among top managers and board members (cf. Finkelstein and Mooney, 2003). Characterizing the fungibility of resources *ex ante* (before market introduction) is possible. For brands, it involves identifying the semantic network of brand associations that customers hold in their long-term memory (cf. review of techniques for eliciting brand associations in John *et al*., 2006), and judging the fit of the dominant associations with possible extensions. Second, decision makers should consider all modes of resource alteration and their requirements. Leveraging existing resources requires that these resources be fungible; creating new market-related and/or technological resources requires marketing and/or R&D second-order competences, respectively (Danneels, 2008); accessing external resources requires valuable complementary resources (Harrison *et al*., 2001), and the funds from releasing resources should be returned to shareholders or used for viable renewal (Harrigan, 1980). Third, it is possible to try to 'peek into the future' to see what opportunities and threats it holds that would make the exercise of dynamic capability attractive or necessary. Analysts can project trajectories of performance offered by technological alternatives and the trajectories of performance demanded in various market segments (Christensen, 1997). This requires a broad view of emerging technologies and a deep understanding of the needs that customers are seeking to satisfy.

It should be noted that Smith Corona was in many ways a successful company, indeed, it was an American icon. The study of Smith Corona's history suggests that firms may survive and prosper for a long time without dynamic capability, tracking the life cycle of products. The company survived for over a century, tracking the life cycle of different form factors of typewriters. This life was punctuated only twice: once by a transition to electric typewriters and once by a transition to ETs (cf. Tushman and Anderson, 1986). These transitions involved the exploration of new technology, but did not require different market-related resources. The development of a competence in electronics was its last manifestation of dynamic capability. Smith Corona never again engaged in exploration, and eventually became obsolete.

Could Smith Corona have done anything different that may have saved the company? Or was the company's demise inevitable? Various remedies, such as the creation of a new brand or the development of new technologies are easy to imagine. They all involve building new resources and competences. The normative question 'should anything different have happened?' is more interesting. Dew, Goldfarb, and Sarasvathy (2006: 73) question whether it is desirable 'to keep the corporation alive and thriving at all costs and under all circumstances.' An implicit assumption in the strategic management literature is that firms need to strive for survival, whereas finance and population ecology perspectives accept the limited longevity of firms (Dew *et al*., 2006). From the perspective of its employees and the communities in which it operated, Smith Corona's survival would have been desirable. But from an arm's-length capital allocation perspective, would it have been rational to invest money into changing the resource base of Smith Corona relative to alternative investments? I don't think such expenditures would have been justified, from investors as well as public welfare perspectives. First, the firm had no resources or competences that could be leveraged. It seems more rational to invest in another company, either a new venture with a blank slate (e.g., Dell), or an established firm with resources and competences to leverage (e.g., Lexmark, which used the broader IBM brand as a stepping stone). In assessing the rationality of investing in renewal, Dew *et al*. (2006) show the importance of complementary assets, which could be beneficial or detrimental depending on whether they increase or decrease the value of adding new resources to

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the firm. Smith Corona's only remaining complementary asset was its brand, and it was detrimental. Moreover, building new resources and competences does not require only expending money. Recent research (Danneels, 2008) shows that organizational factors—such as slack, the willingness to cannibalize, constructive conflict, and scanning—impact second-order competences. Smith Corona's poor showing on these factors suggests that even if it would have been desirable to create new resources and competences, the company may not have been able to do so.

Finally, Smith Corona's demise sheds light on the joint role of endogenous and exogenous forces in the long-term survival and prosperity of firms. The firm's resource base was endogenous; it accumulated over time as a result of choices that spanned decades. The constraints this base subsequently imposed were of the firm's own making. Concomitantly, exogenous changes, such as in technology and distribution, reduced the value of Smith Corona's resource base. Its current resources were of little value for extending into new directions, and it did not create new resources. Even though Smith Corona was a long-lived and successful company within its particular product category, it could neither draw on its existing resources nor build new ones when that product category became obsolete. Smith Corona was stuck in its product type. As its typewriters reached the end of the line, so did the company.

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