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B2C - bubble to cluster: the dot.com boom, spin-off entrepreneurship, and regional industry evolution

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**B2C - Bubble to Cluster: The Dot.com Boom,
Spin-off Entrepreneurship, and
Regional Industry Evolution**

by

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B2C - Bubble to Cluster: The Dot.com Boom, Spin-off Entrepreneurship, and Regional Industry Evolution *

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Abstract: This article studies entrepreneurial activities emerging out of one of Germany's most prominent dot.com firms: Intershop, a maker of e-commerce software. We show that Intershop spawned at least 30 spin-offs. The majority entered locally, giving rise to a small but growing software cluster and counteracting the job losses accompanying the parent firm's drastic downsizing after 2000. We trace the knowledge transfer from Intershop to the spin-offs and relate it to recent theorizing on the spin-off process as well as spin-off-based cluster formation. The Intershop case suggests that temporarily successful dot.coms could exert lasting effects on regional development.

Keywords: spin-offs, serial entrepreneurship, industry agglomeration, software industry.
JEL classification: R10, O18, J60, L86

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1. Introduction

Assessments of the dot.com boom in the late 1990s have shifted between two extremes. Before the stock markets crashed in 2001, there was widespread enthusiasm about the “new economy,” often including the willingness to believe that in the Internet age, basic economic principles were no longer valid. After the collapse, the enthusiasm rapidly gave way to a new conventional wisdom holding that the “new economy” was little more than an unfortunate coincidence of greed, hubris and naïveté, producing little that was of lasting substance. From the investor’s perspective, the latter assessment is indeed straightforward, given the large amounts of money lost, as well as the fact that many of the dot.com firms have folded altogether.

This article explores the possibility that dot.com firms had substantial, lasting effects that are not reflected in the investor’s portfolio. We take our motivation for this study from two strands of literature. First, in the literature on serial entrepreneurship, it has been suggested that analyzing individual ventures in isolation may be insufficient to evaluate the importance of entrepreneurship, as it neglects potential effects of entrepreneurial experience on the performance of later ventures started by the same entrepreneur (Westhead and Wright, 1988; Sarasvathy and Menon, 2004). Second, recent empirical studies indicate that individual firms can trigger cluster formation by providing a seedbed for subsequent spin-off entry, which tends to be concentrated locally. Examples include Fairchild Semiconductors in Silicon Valley (Moore and Davis, 2004), SP Radio in the Danish telecommunications cluster (Dahl et al., 2003), and B.F. Goodrich’s role in the emergence of Akron, Ohio, as the center of the U.S. tire industry (Buenstorf and Klepper, 2005). Can we observe similar dynamics in regions that were home to (temporarily) successful dot.com firms?

To answer this question, we focus on learning processes within firms. Previous research on spin-offs has highlighted the role of incumbent firms as training grounds for employee learning (Garvin, 1983; Agarwal et al., 2004; Klepper and Sleeper, 2005). However, little is known about what exactly spin-off founders have learned in their previous employments and what kinds of knowledge transfer underlie the often exceptional performance of spin-offs. Also, the interrelations between the regional spin-off process and other processes affecting cluster dynamics, such as regional network dynamics, the provision of entrepreneurial role models (Fornahl, 2003), and the triggering of non-spin-off entry (see, e.g., Bresnahan et al., 2001; Feldman, 2001), are largely unexplored.

In this article, we begin to pursue these issues in an explorative case study. We trace the regional legacy of one of Germany's most prominent protagonists of the dot.com boom: Intershop Communications, Jena-based maker of e-commerce software. Intershop was a global pioneer of e-commerce software development that grew rapidly during the boom. It subsequently encountered severe difficulties and has lost money throughout almost all its corporate lifespan. Like with other fallen dot.com stars, today's conventional wisdom has it that Intershop was an unequivocal failure. The firm has recently been singled out as the biggest annihilator of investor money by the German association of private investors (Deutsche Schutzvereinigung für Wertpapierbesitz, 2006). According to its estimates, stock valued Euro 10,000 at the end of 2000 would have a value of Euro 27 at the end of 2005. And even though Intershop has survived to date, it was forced to drastically downsize its operations and has laid off the majority of its employees.

We suggest below that, in spite of its short-lived success and subsequent decline, Intershop has made a significant and potentially lasting contribution to the favorable development of its hometown. The firm's growth opened a new trajectory for local development that is based on software development rather than the traditional local industries, most notably optics and instrument-making. More recently, the decline of Intershop was accompanied by new entrepreneurial activities initiated both by Intershop's founding team and by employees leaving the firm. Through creating new employment opportunities and keeping human capital in the region, the spin-offs helped to sustain the favorable regional dynamics initiated by the parent firm. Based on extensive interviews, our empirical analysis allows us to identify the main channels through which Intershop enabled these subsequent activities. Our results provide new insights into employee learning as a basis of spin-off activities, and also into the links between the spin-off process and other aspects of regional industrial dynamics, including labor pooling and regional cooperation. In addition to presenting specific findings for the Intershop case, the study thus suggests new directions for future quantitative work.

The remainder of the article is organized as follows. Section 2 provides the theoretical background of the following analysis by summarizing prior work on spin-off formation as well as on the role of spin-offs in the evolution of industry agglomerations. Section 3 presents the empirical approach of the study. Section 4 presents our narrative on the growth and subsequent decline of Intershop. Section 5 turns to the entrepreneurial activities by Intershop's founding team accompanying the firm's recent downsizing. Section 6 discusses the spin-off activities of other Intershop employees. It also relates how a local support

structure for nascent software entrepreneurs developed with Intershop's support. Section 7 studies additional regional effects of Intershop's development. Section 8 discusses the implications of the case study for the emerging literature on spin-offs and spin-off-based clustering. Section 9 concludes.

2. Theoretical background

Spin-offs (i.e., startups organized by former employees of firms active in the same industry) have recently been the object of intense scholarly attention. In this section, we summarize prior findings on the spin-off process and the role of spin-offs in regional cluster formation. The emergence of spin-offs is then related to the Marshallian agglomeration economies associated with successful regional clustering.

The emergence of spin-offs

Spin-offs are a distinctive subset of entrepreneurial startups. Empirical research has identified a number of regularities in the spin-off process and in spin-off characteristics. Studies of different industries (e.g., Klepper, 2002; Agarwal et al., 2004; Klepper and Sleeper, 2005; Buenstorf and Klepper, 2005) found that on average spin-offs outperformed other *de novo* entrants. This suggests that based on knowledge they acquired while working for the parent firm, spin-off founders bestow capabilities on their ventures in ways that other founders do not. Recent work has also found spin-off success to be related to the duration that their founders were employed at the parent firm, and also to the kind of jobs they held (Dahl and Reichstein, 2006). Time requirements of on-the-job learning, as well as superior learning opportunities faced by individuals in higher-level positions, can account for these results.

In addition to enabling the acquisition of knowledge, prior industry experience also affects whether a business opportunity is discovered and how it is framed (Shane, 2000). Klepper and Sleeper (2005) show for the U.S. laser industry that spin-offs tended to enter into markets that are closely related to those served by their parent firms. These authors also find that spin-offs drew on specific knowledge their founders accumulated on their prior job rather than on more general business experience. Buenstorf (2005) finds similar patterns in the German laser industry.

While on-the-job-learning enables employees to organize spin-off companies, the empirical evidence suggests that actual spin-off formation is frequently related to events in the parent firm such as changes in leadership and mergers or acquisitions. Such events often

induce strategy conflicts (Klepper and Thompson, 2006) and/or lead to disruptions in the individual employee's working environment, rendering the new job situation less attractive to the employee. In analogy to a distinction often made in the entrepreneurship literature, spin-offs can thus be subdivided into "opportunity spin-offs" driven by the identification of viable entrepreneurial opportunities and "necessity spin-offs" that are primarily triggered by external events.

Research linking the characteristics of parent firms and spin-offs further corroborates the conjecture that knowledge is transferred in the spin-off process. First, the performance of spin-offs is positively related to that of their parents, i.e. success breeds success in the spin-off process. Second, better-performing incumbent firms are generally more "fertile" as breeding grounds of spin-offs. The latter result has been further refined by Agarwal et al. (2004) who distinguish between the potential and the actual number of spin-offs. They suggest that while the number of potential spin-offs increases with the capabilities of a firm, the actual number of spin-offs is greatest when a capable firm generates new business opportunities without exploiting them itself.

Spin-off-based cluster formation

Recent empirical work on regional agglomerations shows that spin-offs play a crucial role in the formation of industry clusters. This was found, among others, for industries as diverse as the semiconductor industry (Moore and Davis, 2004), the U.S. automobile industry (Klepper, 2004), the U.S. tire industry (Klepper and Buenstorf, 2005) and the Italian plastics district of Correggio (Patrucco, 2005).¹ Spin-offs predominantly enter at or close to the location of their parent firm. Thus, new entrants into the cluster develop endogenously within the region, and their capabilities derive from those of the parent firm(s).

Due to the self-reinforcing "success breeds success" dynamics of the spin-off process, historical singularities like the chance event of bringing one or a few successful early entrants to a specific region can give rise to long-run effects on regional development. The nature and orientation of early entrants in a region thus shapes the technological paths of further development in the region. Moreover, given the role assigned to critical mass and hysteresis effects in dynamic models of cluster formation (Brenner, 2004), it is conceivable that entrants can trigger lasting regional developments even when they are only temporarily successful themselves.

¹ A variant of the spin-off-based model of cluster formation was observed in Cambridge (U.K.), where spin-offs from technical consultancies, often becoming involved in product design and the commercialization of new technologies, have gained in importance relative to university spin-offs (Lawson, 2003).

Spin-offs and regional external economies

The intra-regional transfer of organizational capabilities through the spin-off process provides a theoretical account of cluster formation that does not depend on the presence of external economies stemming from traditional Marshallian agglomeration economies (Buenstorf and Klepper, 2006). However, actual interrelations between the spin-off process and other dynamic processes of cluster evolution are largely unexplored. Such interrelations may be relevant along two dimensions.

First, the growth of successful early entrants in a region may give rise to positive external effects on regional development. Benefits accruing from these externalities favor the emergence of spin-offs, but are not restricted to them. They may operate through a variety of channels. For example, successful firms add to the supply of human capital by attracting skilled employees to the region and enabling employees to accumulate knowledge on their jobs, thus enhancing the regional knowledge base (Fornahl, 2007). Prior work on industrial clustering also highlighted the impact of new and growing firms on regional cooperation, customer-supplier relations, regional value chains, and the orientation of the regional universities and public research organizations (Lundvall, 1988; Audretsch and Feldman, 1996; Gray et al., 1996). Yet further effects may operate in a more indirect, cognitively mediated fashion. Successful entrepreneurial activities provide positive role models in the region, thus affecting other agents' attitudes toward entrepreneurship, their ability to perceive entrepreneurial opportunities, as well as their willingness to start firms themselves. In this way, cognitive factors help to explain regional differences both in the extent and the nature of entrepreneurial activities (Fornahl, 2003; Sørensen and Sorenson, 2003).

Second, the spin-off process itself may be strongly intertwined with the emergence of Marshallian agglomeration economies. Based on a case study of an Italian manufacturing district, Patrucco (2005) suggests that local spin-offs drove the regional diffusion of knowledge and the emergence of a common knowledge base. The highly specialized spin-offs created opportunities for high rates of vertical disintegration through sub-contracting. The spin-off process can likewise be expected to enhance the potential for labor pooling in a region. It increases the number of potential employers active in the same industry, which makes the region more attractive for specialized workers. Personal contacts between spin-off founders sharing a prior employment in the same firm are moreover a powerful source of regional social networks, which have been identified as important channels to access resources crucial for starting and operating a firm successfully (Sorenson, 2003).

3. Approach and data

The general methodology adopted below is that of an explorative case study (Eisenhardt, 1989). As is typical for this approach, we draw on a variety of kinds and sources of data, in particular interviews, survey methods and archival material. Our empirical research builds on an earlier project that focused on regional determinants of entrepreneurial activities in Jena (Fornahl, 2007). As part of that project, which was not specifically targeting software firms, 24 interviews with local experts, managers and entrepreneurs were conducted. Additionally, a postal survey of 93 regional firms was performed.

For the present project, we initiated a new wave of empirical research activities in 2005/2006. We began by collecting publicly available material on the development of Intershop. Given our interest in spin-off activities, a list of spin-off firms was generated next (cf. Table 2). In compiling this list, we relied on public resources such as media reporting, corporate web sites and online network platforms, which we complemented by information directly obtained from former Intershop employees. Following the suggestions of Eisenhardt (1989), we then chose a strategic subset of spin-off founders and other local industry experts with whom we conducted extensive, semi-structured interviews. We primarily focused on spin-off founders who had remained in the Jena region, and made sure to exploit the whole spectrum of founder backgrounds and spin-off types (cf. Eisenhardt, 1989, pp. 536-7). Specifically, our field research covers the new entrepreneurial activities of Intershop's founding team and the former members of the firm's top-tier management, but also several spin-off founders who had held more marginal positions and had shorter employment spells at the parent firm. In total, 11 spin-off founders were interviewed, covering more than half of the local spin-off population. The number of interviews allows for substantial triangulation, enabling us to sort out general dimensions of the spin-off process from those aspects that only apply to specific cases or substantially differ between individual spin-off firms. To get a more encompassing view of the local industries, we conducted additional interviews with founders and managers of other local software firms, as well as with an academic computer scientist working for the local university. The typical interview lasted for 1-2 hours.

The focus on interviews with spin-off founders is in line with Schoenberger (1991) who points out that corporate interviews are peculiarly valuable to account for the situational complexity generally faced by decision makers in firms. Especially in contexts with changing organizational and regional structures or processes, interviews are a suitable research strategy to identify the driving forces underlying these dynamics. We utilized the interviews both to test causal relationships suggested in the existing literature and to develop new conjectures on

the spin-off process and regional industrial dynamics. Our theory-building approach thus follows the iterative process described by Eisenhardt (1989).

4. The rise and fall of Intershop

Intershop Communications AG was a poster child of the German “new economy.” Founded in 1992 by Stephan Schambach, Karsten Schneider and Wilfried Beeck under the name NetConsult Communications GmbH in the formerly socialist East, the maker of e-commerce software appeared to be an impressive success story. Initially the firm primarily sold computer hardware and networks, but it also engaged in some software development. Schambach had grown up in East Germany. Dropping out of his studies at the University of Jena, he started to sell home-assembled computers even before Germany was reunited (Virtel, 2001). Schneider likewise was an East German native, who worked as an electrical engineer with the local Carl Zeiss company. After the end of socialism, he briefly ran a used-car business before joining a small computer firm. Finally, Beeck was a West German computer scientist with substantial prior entrepreneurial experience before co-founding Intershop. He had started his first software firm in 1983 and was distributing Steve Job’s NeXt Computers when he joined forces with Schambach and Schneider to start Intershop.

Intershop’s development into an e-commerce software producer began in 1994 when, based on an idea by Schambach, the firm integrated its internal order processing system into the Internet (Berberich, 1999). The firm subsequently specialized on web-related software development. In 1995 it introduced Intershop Online, the first standard software for e-commerce applications. One year later, Intershop was the first German software firm to attract VC funding (ibid.). It was thus able to grow rapidly. Intershop subsequently tried to attain global market leadership in e-commerce software, a strategy that at the time convinced many growth-oriented analysts and investors. To be closer to the crucial U.S. market, it relocated its corporate headquarter to San Francisco.

In 1998, Intershop went public on the German *Neuer Markt*² and subsequently also on NASDAQ. Its stock price skyrocketed (cf. Figure 1). At one point, the firm had a stock market value of more than Euro 11.1 billion (March 10, 2000). Intershop’s revenues increased from Euro 0.54 million in 1996 to nearly Euro 123 million in 2000, while its worldwide employment rose from 43 to 1,218 in the same period (cf. Table 1). The firm was widely regarded as a bluechip among the German “new economy” firms. In February 2000, U.S.

² The *Neuer Markt* was a growth- and technology-oriented segment of the German Stock Exchange started in 1997 and closed down in 2003. Intershop was the first East German startup to be listed on the *Neuer Markt*.

magazine *Business Week* ran a story on Intershop titled “Germany’s Hot Star,” which likened the Jena startup to Hewlett-Packard in its early days (Echikson, 2000). A crucial ingredient of Intershop’s standing among analysts and investors was that as opposed to many other German startups, it had early on focused on its presence in the U.S. market. During that time, Intershop claimed global leadership in the e-commerce market. Co-founder Stephan Schambach attained celebrity status as a successful German high-tech entrepreneur, and Intershop executives were sought after experts to comment on policy discussions covering issues like entrepreneurship, the Internet and even immigration policy. In 2000, the firm’s local operations were moved to Jena’s tallest building, a 150-meter glass tower. Originally constructed as a socialist prestige project, this building was renamed Intershop Tower and remodeled into an office building custom-equipped for the needs of an IT firm.

Intershop’s public image changed drastically after the firm lost 70 per cent of its stock market value on a single day early in 2001. Not only were the judgment skills of its management questioned. It was alleged that the firm had withheld bad news from its investors. Lawsuits and criminal prosecution ensued. In the following years, all three founders resigned from Intershop’s active management. Beeck left Intershop in 2002, Schneider in 2003. Also in 2003 Schambach resigned as CEO. The position was taken over by then CFO Jürgen Schöttler, an economics PhD and experienced “old economy” executive (Klawitter, 2003). Subsequently, Schambach left Intershop’s management altogether and, like his former co-founders, engaged in new entrepreneurial activities (see section 5 below).

An widespread assessment, which was generally shared by our interview partners, is that Intershop’s software products were of high quality, while the firm’s major weakness was the marketing of the products. Moreover, in retrospect Intershop’s strategic orientation toward the high-end segment of the e-commerce software market has been criticized. Intershop’s flagship product “Enfinity” may have been too complex for many potential customers’ IT infrastructure (von Bredow and Jung, 2001).

For the past five years, Intershop has been on the decline. Revenues, R&D investments, employment and stock price have all decreased tremendously (cf. Table 1). To save money, branches outside Europe and the U.S were shut down, and Intershop’s corporate headquarter was moved back from San Francisco to Jena in 2002. A large number of employees were laid off or left the firm on their own initiative. Intershop presently has some 200 employees and annual revenues of roughly Euro 15 million. While shrinking the firm to a sustainable size, the new management tries to safeguard Intershop’s future prospects by bringing in fresh capital as well as strengthening the firm’s marketing and sales divisions.

Intershop's license revenues from existing customer accounts, which include names such as Hewlett Packard, Deutsche Telekom and Otto, are still substantial, but the firm acknowledges problems in attracting major new customers (Ostthueringer Zeitung, October 28, 2005). At the moment, its odds of survival are unclear.

5. New entrepreneurial activities of Intershop's founding team

As indicated in the previous section, all three members of Intershop's founding team had prior entrepreneurial experience when they started Intershop. It was also noted above that all three have left the firm's management during its recent decline. Since then, they have all engaged in renewed entrepreneurial activities.

Wilfried Beeck's departure from Intershop involved a fissioning of the firm. As part of its downsizing, the firm decided to focus its activities on the high-end Enfinity software, and to sell the rights in Intershop 4, which derived from Intershop's original product and was targeted to SMEs and hosting providers. Beeck initially tried to find a buyer for Intershop 4. When these attempts failed, he was offered to take over Intershop 4 himself, as well as the existing customer accounts. Beeck then transferred the rights in Intershop 4 to a firm named ePages, which is the legal successor of an earlier firm he started back in the 1980s. EPages attracted a number of former Intershop employees, and in addition to the founder, the entire top management team of ePages consists of former Intershop managers.

Beeck's departure from Intershop is indicative of a disagreement on strategy. His assessment of the market potential of Intershop 4 differed from that of the other owners who favored a concentration on the Enfinity software (Toparkus, 2004). Notwithstanding its focus on smaller-sized customer firms, ePages continues to upgrade its product, for example by enabling its integration into Internet marketplaces such as eBay. In 2004, it introduced ePages 5, which is characterized as an entirely new development (cf. ePages corporate website).

Pixaco was started by Karsten Schneider in 2003. Pixaco's business model is to provide a web portal allowing customers to upload digital image files for professional printing. The firm originated from the Bilderservice.de web portal, which was first started in 1999 by Creative Online Systems (later renamed into Vimago), an Intershop partner firm located in nearby Weimar, on the basis of Intershop's e-commerce software. Already before Pixaco was started, the digital photo processing facilities associated with Bilderservice.de were moved to the Intershop Tower in Jena. Given its heavy data traffic, the tower's sophisticated IT infrastructure is a major asset for Pixaco (Querengaesser, 2004).

Former Vimago employees, including its software architect, joined Pixaco's initial management team. The new firm discontinued further development of the Bilderservice.de portal. Instead, it created a new, user-friendly portal to reach the end consumer market. In December 2005, Pixaco was acquired by Hewlett-Packard in a trade sale. Subsequently, it has been fully integrated into Snapfish, Hewlett-Packard's online photo service subsidiary. Schneider became Snapfish's managing director, and Pixaco's facilities were turned Snapfish's headquarters for Continental Europe.

In contrast to the other two Intershop founders, Stephan Schambach started his new firm, Demandware, outside Jena and Germany. Demandware was organized in 2004 and located in the Boston region (Frankfurter Allgemeine Zeitung, February 21, 2005). Demandware's business model is to combine e-commerce software development with on-demand software distribution (also known as software-as-a-service), which Schambach perceived as the emerging dominant distribution model for business software. With on-demand software, customers do not install the program on their own computers, but rent computing time on the provider's computers. License fees are based on actual use rather than flat rates. Convinced that the market for e-commerce software demanded a new distribution model, Schambach initially attempted to change Intershop's strategic orientation toward the on-demand concept. According to Demandware's founder, the new firm was organized only after the new business model encountered massive resistance and turned out to be impossible to implement within Intershop's existing organization.

Demandware aspires to become the leading producer of on-demand e-commerce software and possibly also a leading platform for business software more generally. It is VC backed and employs a number of former Intershop employees. Most notably, the firm hired Intershop's former chief software architect, Ulrike Mueller, who was in charge of the concept and design of Intershop's Enfinity software. With its currently 60 employees, Demandware is the fastest-growing of all new firms spawned by Intershop. Even though it located far from its roots, Demandware has cooperations with Intershop spin-offs located in Jena as well as long-term Intershop partner Deutsche Telekom. In February 2006, Demandware secured second-round VC funding of \$ 12 million (Demandware, 2006).

All three new ventures of the Intershop founders are strongly influenced by their earlier experiences at Intershop. Both Beeck and Schambach remained active in Intershop's core market – development of e-commerce software – with their new firms. Even though they both focus on market segments and strategies somewhat different than Intershop's, their new firms represent a competitive challenge to at least some of the parents firm's business. The

strategic differences between the two new firms are pronounced. EPages basically tries to build on Intershop's early success, keeping its software simple and affordable for smaller-scale customers. The firm stresses its profitability rather than its growth potential. Its strategy is more conservative than that of Demandware, which, similar to Intershop in its early days, strives to be pioneering a new software market (on-demand software) that promises opportunities for growth. With Demandware, Schambach moreover repeats Intershop's strategy of locating in the U.S., the global center of the e-commerce market.

Pixaco differs from the other firms in that it is not (primarily) a software developer but a provider of a web-based service (digital image printing). The Intershop impact on this firm is nonetheless discernible. Pixaco's web portal, originally developed by an Intershop partner firm, was from the beginning based on Intershop software. It is questionable whether it would have been created without Intershop's regional presence. Moreover, Schneider's ability to perceive the opportunity presented by Bilderservice.de and to use the portal as the cornerstone of a new firm reflects his Intershop experience.

6. Employee spin-offs and a self-organized technology park

In addition to the new ventures started by the three Intershop founders, other firm members also engaged in entrepreneurial activities after leaving Intershop. Even though the origins of some spin-offs predate Intershop's problems, the firm's subsequent downsizing induced a number of its employees to start their own businesses, and spin-off activities were also encouraged by the Intershop management.

No complete listing of Intershop spin-offs exists. However, based on various online resources, local information, and personal communication, a minimum of 27 new firms started by former Intershop employees (in addition to the 3 firms discussed above) could be identified (cf. Table 2 for details).³ 14 of the 27 firms are spin-offs in the strict sense of having entered into software development activities. Another third of the new firms (10) entered into consulting activities, which is little surprising given low barriers to entry in that industry.

Only a single spin-off (Ageto/Truition) entered in the same industry segment (i.e., e-commerce software development) that Intershop, as well as two of the founders' new firms (Demandware and EPages), are active in. Ageto/Truition moreover concentrates on a specific kind of e-commerce software enabling the integration of e-commerce activities and online

³ This number does not include a handful of ex-Intershop employees who now work as free-lance programmers or self-employed consultants.

auction platforms such as Ebay. Similarly, most other spin-offs follow strategies that are related to e-commerce, but depart substantially from the parent firm's business model.

The business models of many spin-offs indicate these firms exploit very specific knowledge and experience that their founders gained at Intershop. Xceptance, co-founded by Intershop's former head of quality control and its legal advisor, develops and markets quality tests and automation techniques for software quality control. The founder of Mokkafish, which initially focused on developing user interfaces, was in charge of interface design at Intershop. Similarly, J-media, which produces a standardized software supporting marketing and PR activities, was started by a former member of Intershop's communication department. A direct connection between the jobs they held at Intershop and the focus of their new ventures can also be drawn for some of the employees who started consulting firms. For example, Cresco Services, started by Intershop's former CFO, does financial consulting. TowerConsult, the firm organized by the former director of human resources, offers recruiting services, whereas the former company spokesman started a PR agency. Likewise, one co-founder of Clienthouse, which concentrates on customer relation management consulting, was responsible for customer and partner services at Intershop.

A clearly discernible aspect of the Intershop spin-offs is the ability of their founders to leverage contacts and to perceive business opportunities related to software development and online services. Both Ageto/Truition and EPages are working to integrate e-commerce and online marketplaces. Alea, the new venture co-founded by Intershop's first-round employee and one-time chief software architect, Frank Gessner, develops integrated business software for mail-order firms. Its product is based on programs developed in an earlier firm of Gessner's co-founder (Clemens, 2006). Alea is thus similar to Pixaco in adopting and further developing a business model that has some relation to Intershop's activities but has previously been developed outside the firm. The founder of Synchronity, which focuses on software for "e-government" (public sector e-business solutions) had held project management and software development jobs at Intershop before joining a public bank administering subsidized lending programs at various policy levels. Synchronity's initial product accordingly was a web-based solution for the application and administration of such lending programs. Altogether, those members of Intershop that were most central to its strategic management developed the business models that are most closely related to that of the parent firm. In particular, it is striking that two of the three firms started by Intershop's founders, but only a single employee spin-off, are developing e-commerce software that is at least in part competing with Intershop's product.

The impression emerging from the business models – spin-offs entering in market segments and activities that their reflecting their founders’ positions and projects at the parent firm – was reinforced by our interviews with spin-off founders. Several interviewees emphasized the continuity between their projects at Intershop and the subsequent spin-off activities, as well as the importance of specific skills acquired in their prior jobs. For example, one interviewed founder not only noted that he was still active in the same field of activity as in his time at Intershop, but that the same would hold true for other spin-offs as well. Another founder characterized the software development expertise he had gained at Intershop as a “repertoire that I am still building upon.”

This begs the question how Intershop was able to become a developer of high-quality software in the first place. Its founders had little prior expertise in software development. Likewise, many employees came without degree in computer science, often dropping out from school for their job at Intershop, or even without any background in software development. Our interviewees suggested that Intershop’s early entry into the e-commerce business, coupled with fortunate initial hiring decisions for key R&D positions, explains the firm’s ability to develop its technological capabilities. Moreover, it should be noted that not all of the specific skills that future spin-off founders acquired at Intershop were related to software development. Rather, the importance of programming capabilities acquired at Intershop varied according to the position that the founder had occupied (and consequently the spin-offs’ business models also differed).

Another dimension of learning was frequently stressed in the interviews: the importance of having gained work experience in a fast-growing, internationally active entrepreneurial firm. Besides lacking software-related expertise many Intershop employees, including spin-off founders, joined the firm without any prior job experience. Our interviewees consistently emphasized the autonomy and room for experimentation that had characterized their Intershop jobs. Relatively junior employees handled large-scale projects and were delegated staff-supervision responsibilities. Also, working at Intershop often involved the management of international projects; an aspect that was particularly relevant for the majority of employees socialized in the isolation of pre-1989 socialist East Germany. In contrast, none of the respondents confirmed that the role model provided by the Intershop founders had significantly affected their own decision to start a firm.

In addition to the skills acquired through on-the-job learning, the entrepreneurial activities of ex-Intershop employees also benefited in a very direct way from the parent firm’s temporary financial success. Even though we were unable to collect systematic information of

the interviewees' personal wealth, several respondents openly acknowledged that money from trading Intershop stock had enabled their own spin-off activities, as well as those of other founders. In individual cases, supplier contracts with the parent firm were moreover important for overcoming initial difficulties. Most of the spin-offs started out on a small scale and without VC backing. However, we were often told of cross-investments among the spin-off founders, many of whom hold personal ownership positions not only in their own firm but also in other spin-offs.

Intershop played an active role in enabling and fostering the entrepreneurial activities by its former employees. When it began to lay off employees at a large scale, the firm utilized a German law allowing for publicly subsidized transfer firms. Under that law, the laid-off employees received a publicly funded transfer income (roughly corresponding to unemployment benefits), while Intershop had to cover both social insurance payments and re-training costs for the employees. Intershop's former director of human resources suggests that this institutional arrangement was more costly than the alternative of just laying off the respective employees, even including litigation and settlement costs that could be expected to arise in the latter case. Part of Intershop's motivation to incur these costs was to try and retain software competences in the region. From the beginning, it was expected that some of the employees shifted to the transfer firm would engage in entrepreneurial activities to find new employment.

The transfer firm became the nucleus of the TowerByte cooperative of software firms organized late in 2003. TowerByte's members are start-ups whose activities are related to software development. At present, the cooperative has 16 member firms with an aggregate employment of 145. 12 of them are Intershop spin-offs, but the cooperative also attracted startups whose founders have no Intershop background. One local software firm – originally founded as a spin-off from the local university – even moved from Jena's publicly funded but not software-specific technology park to the cooperative's premises. The individual firms focus on different submarkets and services. Accordingly, they are not directly competing with other members of the cooperative.

The TowerByte cooperative provides a number of services to its member firms. It rents office space in the Intershop Tower, which is occupied by the member firms. The firms are thus able to benefit from the building's IT and service infrastructure as well as from the proximity to Intershop, EPages, Pixaco (which are all located in the Tower) and the other member firms. The Tower is also home to a specialized provider of network administration services. As a consequence of the available technological infrastructure and services, new

firms can start small and quickly. In addition, the cooperative pools resources in the purchases of supplies and the provision of business services.

Since the TowerByte members differ in their specific competences, they are able to help each other by providing specific expertise, access to customers, and small-scale loans (Kalla, 2005). Our interview partners from the cooperative stressed the role of information flows among the member firms. They also suggested that the presence of other software firms makes it easier for member firms to hire new employees, since the presence of potential alternative employers significantly reduces the risk of joining a small startup. The larger size of the cooperation is moreover seen as a valuable signal of credibility to customers, enhancing their willingness to do business with the rather small member firms.

The TowerByte cooperative thus seems to operate like a well-functioning, software-specific technology park. It is special, however, in that it is based on private initiative rather than public policy. Moreover, while the cooperative is not entirely independent of outside funding, public funds play a relatively minor role in sustaining it. As was acknowledged in our interviews, the high degree of self-sufficiency is largely due to the low capitalization required to start a software firm.

7. Beyond spin-offs: Intershop's effect on regional development

In the previous sections, we demonstrated how the rise and subsequent decline of Intershop enabled a wave of entrepreneurial activities by former firm members. Through the spin-off activities emerging from Intershop, a substantial number of new software firms were created in its home region. In the present section, we discuss additional effects that Intershop may have had on the development of a regional software industry. Guided by the literature on industrial clusters, we focus on three relevant dimensions: human capital formation, regional cooperation, and the provision of entrepreneurial role models.

Intershop's growth strongly increased the pool of software-related human capital in Jena, which, except for a few small companies catering to the technical software needs of the local manufacturing firms, did not have a substantial prior software industry. The firm's local employment in Jena peaked at some 700 jobs, with the remaining employment largely being divided between San Francisco and Hamburg, where the financial operations were concentrated. Jena has always been the center of Intershop's product development, and accordingly its local employment was biased toward programmers and software developers. As was indicated by Intershop's former director of human resources, most of them came from

the broader region. University graduates with degrees in computer science were predominantly hired from the surrounding Technical Universities in Leipzig, Ilmenau, Chemnitz and Dresden. Because of its profile, the local university was less important as a provider of human capital. In addition to university graduates, the firm hired – particularly during its most rapid growth phase – a number of employees with more remotely related professional backgrounds, university dropouts etc.

For the local pool of human capital, capabilities that employees acquired on their jobs at Intershop may have been even more important than the firm's recruitment of computer scientists. As was noted above, the firm hired numerous employees who had no software-related education or job experience. In this context, the high quality of Intershop's software development was crucial, as it helped to provide a fertile learning environment for acquiring programming skills, particularly in the emerging field of e-commerce software. In line with this conjecture, one spin-off founder suggested that Intershop may have operated as a "breeder of e-commerce competences."

When Intershop laid off almost 500 employees in Jena, this pool of software-related human capital was not only accessible to its spin-offs, but also to other firms in the region. Our interviewees suggested that indeed many of the employees, particularly those coming from the broader region, attempted to stay in Jena. Official labor market statistics are consistent with this characterization. The number of skilled IT employees ("*Datenverarbeitungsfachleute*") approximately doubled in Jena from 1994 to 2001 (Figure 2).⁴ This positive development coincided with the growth of Intershop. In contrast, the subsequent downsizing of Intershop's activities is not reflected in the labor market figures, which largely remained stable after the burst of the dot.com bubble. In addition to the Intershop spin-offs (which between them have created more than 200 jobs), former Intershop employees found new employment in existing firms outside the IT sector, and also in new software startups, for example those member firms of the Towerbyte cooperative that are no Intershop spin-offs.

In contrast, there is little evidence that the availability of human capital induced existing software firms to move to the region. T-Systems MMS, a Dresden-based multimedia service subsidiary of Deutsche Telekom, is a noteworthy exception. This firm hired a number of former Intershop employees and opened a branch office in Jena, which is led by an ex-Intershop manager. T-Systems MMS cooperates with Intershop and several of its spin-offs. It

⁴ With this rate of increase in IT employment, Jena was substantially above the German average in these years.

is the German distribution partner of Demandware, which is furthermore backed by the T-Systems Venture Fund.

Besides labor pooling and human capital, theories of regional industry agglomeration also emphasize the role of knowledge spillovers and cooperation in local networks. Our interviews suggest that during its growth, Intershop was little connected regionally. Several interviewees characterized Intershop as a less-than-ideal partner for cooperation. Given its ambitious objectives, the firm shunned potential cooperation partners from the region, including the local university, in favor of interregional and international cooperation partners. It was also suggested that Intershop's corporate culture was ill-suited for cooperating with public research. This is consistent with Intershop's failed attempt to endow a chair for e-commerce at the local university, which was intended to form the nucleus of a new program in economics and computer science (Uni-Journal Jena, June 2000). This failure was not only caused by the lack of funds after the burst of the dot.com bubble, but also by a "clash of cultures" between the firm's management and the regulations governing the university's appointments. Apparently, Intershop became more open toward regional cooperation only when its crisis had already set in. Interviewees nonetheless suggested that today, the Intershop spin-offs are more relevant as cooperation partners than the parent firm itself.

Finally, it is conceivable that the temporary success of Intershop influenced local attitudes toward entrepreneurship and the ensuing willingness to start firms, as its founders may have provided positive role models for potential entrepreneurs in the region. Existing empirical evidence of such a role model effect is mixed (Fornahl, 2007). In a series of expert interviews on entrepreneurship in Jena, 14 out of 24 experts mentioned Stephan Schambach as an individual who affected local entrepreneurial activities. No other firm founder was mentioned as frequently. Evidence supporting the notion that the regional entrepreneurial climate affects firm formation moreover emerges from a survey of 93 founders or managers of local startups organized between 1990 and 2001 (*ibid.*, pp. 195-211). Two-thirds of the respondents stated that a positive entrepreneurial climate had been a relevant factor in their founding decision. In addition, one-third of the firm representatives answered that earlier regional founders had positively influenced their own decision to start a firm.⁵ In contrast to these self-reports, however, no quantifiable effect of Intershop's example on subsequent firm formation in Jena was found in the survey. Neither positive founding decisions nor the actual

⁵ No respondent indicated a negative impact of earlier firm formation. This asymmetry may reflect sample bias due to the restriction to firms that were actually started.

formation of startups were correlated with the respondents' ex-post assessment of the regional entrepreneurial climate at the respective time (ibid.).⁶

8. Discussion: Intershop and its spin-offs

Our empirical analysis focused on the entrepreneurial activities by Intershop's founders and employees. In the present section, we discuss the findings from the case study in the context of the prior work on spin-offs and spin-off-based regional clustering.

What lessons about the spin-off process can we derive from the Intershop case? In line with prior literature, the business models of the Intershop spin-offs show that their founders make use of specific experiences and knowledge accumulated while working for Intershop. This impression was confirmed in the interviews. An additional aspect is that those founders who were closest to Intershop's strategic decision making (in particular the founders themselves) started the firms whose activities are closest to the parent firm's markets. Adding to recent findings linking the success of spin-offs to their founders' positions at the parent firm (Dahl and Reichstein, 2006), our study therefore indicates that differences in position at the parent firm not only affect the quality of the acquired knowledge, but also its nature and the relative importance assigned to various kinds of experiences and capabilities. The business models of the Intershop spin-offs are furthermore informative with regard to the parent-spin-off relationship. Since depending on their position, employees acquire specific and in part idiosyncratic capabilities, their entrepreneurial strategies will often differ from the parent firm's business model, thus limiting the extent to which they become its competitors.

It also emerged strongly from the interviews that the general experience of working in a fast-growing, entrepreneurial startup was highly valuable for the subsequent spin-off activities. The spin-off founders' emphasis on the importance of having learned how to run large-scale projects and to lead teams resonates with the notion of an "entrepreneurial career imprint," which has been proposed to explain why a large number of managers hired to lead young startups in the emerging U.S. biotech industry came from a single medical products company, Baxter International (Higgins, 2005). According to this account, Baxter was unique

⁶ There exists, however, a rather illustrative piece of anecdotal evidence for Intershop's effect as a regional role model. A short-lived software firm named Exquisit Technologies was started in Jena in 2000. It focused on speech recognition software, and its founders explicitly acknowledged Intershop as a role model (Financial Times Deutschland, October 17, 2000). In addition, the firm's name itself indicates the Intershop influence. To see this, one needs to know that the name Intershop not only alludes to "internet" and "shopping". Intershop also was the name of the chain of state-run shops that sold Western merchandise (for Western currency) in socialist East Germany. Likewise, Exquisit was the name of shops that sold the highest-quality goods available for Eastern currency.

in that it assigned challenging and highly autonomous jobs to its junior executives. They were thus put in a good position to acquire the skills needed to run startup firms. However, while the “Baxter Boys” joined existing young firms, the founders of Intershop’s spin-offs started new firms themselves.⁷

Prima facie, the Intershop case is less easily reconciled with the “success breeds success” dynamics characterizing the spin-off process, where better incumbents tend to have more and better spin-offs. There are several ways, however, to account for the large number of Intershop spin-offs in spite of the parent firm’s weak performance, which essentially has been struggling for survival since 2001. To begin with, it is plausible that Intershop’s crisis induced employees to form spin-offs who would not have considered entrepreneurial activities under more favorable employment conditions. As was related in section 2, adverse triggering events have been suggested before as crucial ingredients of the spin-off process. Thus, Intershop’s spin-offs were primarily “necessity” rather than “opportunity” spin-offs. It is moreover notable that, in contrast to the theory proposed by Klepper and Thompson (2006), the founders of the Intershop’s employee spin-offs generally discounted the role of disagreements as a factor in their decision to leave.⁸ This may be indicative of substantial differences between spin-offs originating under different conditions, suggesting the need to study “necessity” spin-offs more thoroughly than this has been done before.

In addition, Intershop was a pioneering early entrant into e-commerce software, and its products are highly regarded for their quality. The firm thus seems to accord to the account for actual spin-off generation given by Agarwal et al. (2004). Technological capabilities were developed in the firm, but given its fragile situation after 2000, Intershop was unable to exploit the ensuing opportunities, thus creating a potential for employees to start spin-offs. Since it was laying off employees and had little prospect of broadening the range of its activities, these spin-offs – except when entering into the core e-commerce market itself – did not threaten to become competitors of the parent firm. Intershop could therefore “afford” to support their emergence, as is indicated by its sponsoring of the transfer firm that evolved into the TowerByte cooperative.

Finally, specific characteristics of the software industry, both in terms of its life cycle and in terms of product design, may have added to the propensity of spin-off formation in the

⁷ The finding that young firms tend to have more spin-offs than older, more bureaucratic firms (Gompers et al., 2005) is also consistent with our results.

⁸ Interestingly, as opposed to the employee spin-offs, strategic disagreements were crucial for two of the three ventures started by Intershop’s founders, EPages and Demandware. The latter case shows that even a founder and CEO of an established firm may not be able to pursue a radically new strategy within the existing organization.

Intershop case. Because of the sudden end of the dot.com boom, with Intershop a firm was downsizing that belonged to the technological vanguard in a young industry with low barriers to entry. This contrasts with the frequent pattern that the decline or exit of industry incumbents is part of a more general industry shakeout. In the latter situation, there are much less opportunities for starting successful spin-offs. Software is moreover a prime example of heterogeneous and modular product design. In the laser industry, which is also characterized by heterogeneous submarkets, specialization along submarkets has been found to favor spin-off entry (Klepper and Sleeper, 2005; Buenstorf, 2005). The same pattern would also appear plausible in the software industry. Product modularity is likewise favorable to the formation of spin-offs, in particular since Intershop's emphasis on modularity in software design was a significant aspect of the alleged quality of its products. Modularity is relevant for the spin-off process as it allows for entry by horizontal or vertical disintegration, i.e. specialization on some specific aspect of the software product or its development (note, e.g., Ageto/Truition's strategy of focusing on integration of e-commerce and web marketplaces).

How did the entrepreneurial activities of Intershop's founders and employees affect the firm's home region? With EPages and Pixaco, two of the serial startups formed by the Intershop founders follow the oft-observed pattern that entrepreneurs stay in their home region when starting a new firm (Cooper and Folta, 2000; Fornahl and Graf, 2003). The same holds for the majority of the employee spin-offs. Most new ventures entered at the location where their founders were active before. As Intershop had established various regional branches, this was not always Jena, but still roughly half of the new firms (17) located in Jena, and 3 additional firms entered within a 100-kilometer range. The local entrants created new jobs, thus helping to retain in the region a substantial fraction of the software-related human capital that had been brought in and/or bred by Intershop. Between the parent firm and the spin-offs, the current number of jobs amounts to two-thirds of Intershop's peak local employment. In fact, even though Jena remains a high-unemployment region, our interviewees suggested that their firms' future growth might soon begin to suffer from a shortage of trained software developers.

With Demandware, perhaps the most ambitious of the Intershop spin-offs has located outside Jena and even outside Germany. Demandware's direct effects are probably detrimental to the region, because the firm is a direct competitor to Intershop as well as EPages, and also attracted local human capital away from Jena. At the same time, the firm cooperates with some of Intershop's employee spin-offs, which may give rise to some positive indirect effects on the region.

The tendency of spin-offs to locate in their home region is a key component of the spin-off-based account of cluster formation (Klepper, 2004; Buenstorf and Klepper, 2005). Our analysis confirms this tendency for the Intershop case. More importantly, our findings provide further clues for understanding how spin-offs shape regional industrial dynamics. Because of the differences in their on-the-job-learning experiences, the ventures started by the different spin-off founders also differ in their business models and strategies. As a consequence, they are generally not competing for the same customers, but often offer complementary products and services. Combined with the shared experience of having worked in the same firm, and the ensuing familiarity with each other's strengths and weaknesses, spin-off founders have access to a localized network of capabilities, skills, and financial capital that they can access for mutual benefit. Indeed, while our interviewees dismissed the importance of Intershop's regional cooperation, the importance of the network of spin-off firms was frequently stressed, both within the TowerByte cooperative and beyond. Furthermore, the presence of several employers specializing in similar segments of the software industry reduces the hazard of job losses for potential employees. The interactions between spin-offs thus seem to conform closely to the conventional theories of Marshallian agglomeration economies stressing knowledge spillovers, labor pooling and vertical relationships within clusters.

In this case at least, the spin-off process seems to have been the key to the emergence of a cluster, providing the foundation on which performance-enhancing interactions between firms could develop. Thus, the self-augmenting character of the spin-off process is further reinforced by increasingly powerful external effects of agglomeration. To the extent they are mediated by network membership, the benefits of these external effects would be restricted to former Intershop employees and their entrepreneurial activities. Interestingly, though, with the TowerByte cooperative an institutional framework was established that enhances the accessibility of localized knowledge and other benefits, extending it to startups whose founding context was unrelated to Intershop.

9. Conclusion: From dot.com to regional software industry

From an investor's point of view, Intershop, like many other dot.com firms, was a bad long-term investment. Our objective in the present article was to reconsider this assessment by adopting a regional perspective and tracing Intershop's regional legacy five years after the end of the dot.com boom. We identified key elements of the spin-off-based account of cluster

formation in the Intershop case. Intershop was an early entrant into e-commerce software, and there were no systematic reasons other than the founders' biographical backgrounds why it emerged in Jena and not somewhere else. Intershop's growth attracted human capital to the region and enabled learning processes of its employees. Subsequent spin-off formation by the Intershop founders and other employees spawned a substantial number of additional entrants, and characteristics of the new firms suggest that founders were able to transfer relevant knowledge they acquired at Intershop. Intershop even actively enabled new entry by spin-offs. Intershop thus helped to create conditions that were conducive to the emergence of an industry cluster. The spin-offs stabilized and further enhanced these conditions by establishing a network of local cooperation on the basis of their joint history as former Intershop employees. Spin-off interaction gave rise to Marshallian agglomeration economies in the network. Moreover, with the TowerByte cooperative an institutional setup was created that allows non-spin-off startups to partake in the benefits accruing from the network. As a consequence of these developments, Intershop may well have been the nucleus of a sustainable software cluster, even if the firm itself should go out of business soon.

It is too early to tell whether the Intershop spin-offs will grow and perform sufficiently well to give rise to a stable and further growing software cluster. Thus, as regards Intershop's long-run regional impact, the jury is out. The Intershop case nonetheless shows how a dot.com firm may have had a lasting beneficial effect on regional development – one that potentially will outlive the original firm. A general conclusion can thus be drawn that resonates with the recent work on serial entrepreneurship. In assessing the merits of entrepreneurial activities, not only the fate of the individual firm has to be taken into account, but also the learning effects that condition the performance of future ventures started by the initial entrepreneur as well as other members of the firm. At a less abstract level, if regional dynamics similar to those of the Intershop case are also present in other regions that are or were home to dot.com firms, this may justify a qualification to the *ex post* assessment of the dot.com boom.⁹ Not all of the money spent by the dot.coms may have been wasted, but capabilities may have been created that allow for more sustainable growth and performance of the surviving firms and the second-generation entrants.

⁹ *Ex ante*, we by no means intend to suggest that bubbles are a good thing to have.

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Table 1: Intershop financial and employment data, 1996-2004 (source: Intershop Communications AG, annual reports 1997-2004)

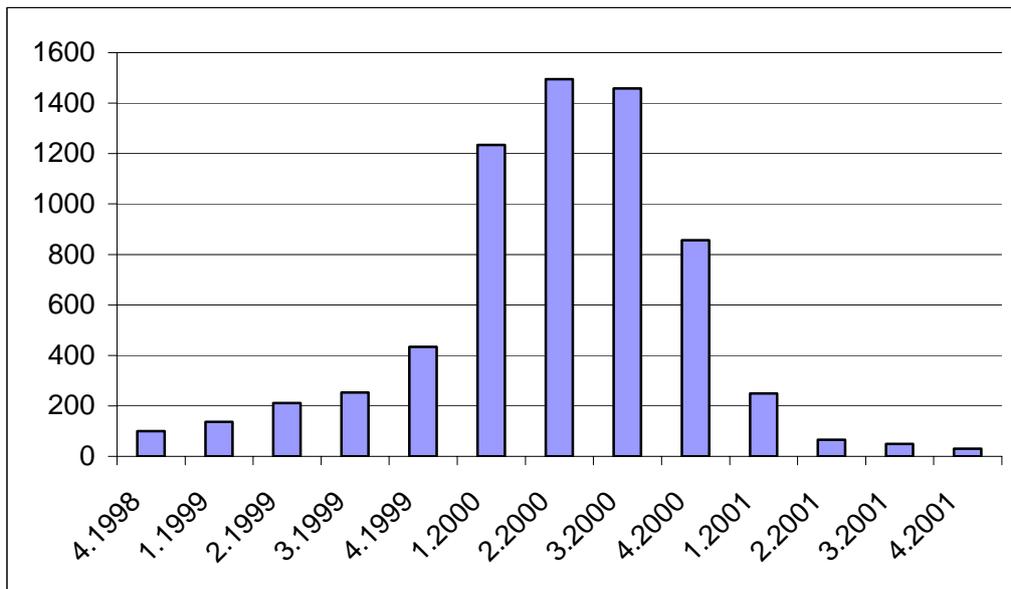
| Year | Revenue (€million) | Profit / Loss (€million) | R&D investment (€million) | Total Employment |
|-------------|-------------------------------|-------------------------------------|--|-----------------------------|
| 1996 | 0.538 | -2.656 | 0.341 | 43 |
| 1997 | 5.036 | -7.956 | 1.000 | 179 |
| 1998 | 17.872 | -17.308 | 4.377 | 353 |
| 1999 | 46.300 | -18.400 | 7.115 | 544 |
| 2000 | 122.994 | -38.900 | 10.191 | 1,218 |
| 2001 | 68.654 | -131.798 | 15.179 | 733 |
| 2002 | 45.097 | -27.555 | 7.225 | 479 |
| 2003 | 23.159 | -18.640 | 6.260 | 371 |
| 2004 | 17.568 | -8.776 | 4.149 | 260 |
| 2005 | 17.792 | -3.312 | 2.765 | 222 |

Table 2: Firms started by Intershop employees, their activities and their founder's position at the parent firm (as of December 2006; various sources)

| | Firm name | Location | Jobs (ca.) | Industry | Business model / field of activity | Intershop position of (co-)founder(s) |
|----|---------------------------------------|----------------------|-------------------|-----------------------|---|--|
| 1 | Ageto (2005 acquired by Truition) | Jena | 24 | E-commerce software | Integration e-commerce and internet marketplaces | (1) Director, Component Consulting (2) Director, Product Management |
| 2 | Alea | Jena | 30 | Software | Business software for mail-order companies | Vice President Software Engineering |
| 3 | Avorium | Weimar | Unknown | Consulting | Software engineering consulting | Vice President R&D |
| 4 | Bestsidestory | Leipzig | 2 | PR agency | Public relation services | Head of marketing |
| 5 | Pixaco (2005 acquired by HP/Snapfish) | Jena | 40 | Web-related services | Web portal for digital photography printing | Founder |
| 6 | Callan Consulting | U.S.A. | Unknown | Consulting | Strategic marketing consulting | Vice President Global Marketing |
| 7 | Clienthouse | Jena | 6 | Consulting | Customer relation management consulting | (1) VP Services (2) Customer and Partner Services |
| 8 | Cresco Group | Hamburg | Unknown | Consulting | Financial consulting services | CFO |
| 9 | Demandware | U.S.A. | 60 | E-commerce software | E-commerce on demand | Founder |
| 10 | Designkorridor | Jena | 5 | Advertising | Web and graphic design | (1) Media designer (2) Web designer |
| 11 | DotSource | Jena | 10 | Consulting | Consulting, software development and sales | Intern, Graduate of Internet Business Engineering Program |
| 12 | Ensigns Corporation | U.S.A. | unknown | Consulting | Management and technology consulting for energy market firms | Vice President |
| 13 | EPages Software | Jena | 50 | E-commerce software | Further development of Intershop 4 | Founder |
| 14 | Facultas | London | Unknown | Software distribution | Distributor for e-mail marketing software; human resource consulting (recruiting) | Practice Leader |
| 15 | IQ-One | Hallbergm. (Bavaria) | Unknown | Consulting | IT consulting and services | Systems administration / technical support |
| 16 | Jmedia | Jena | 2 | Software | Standard software for marketing / PR | Press relations |
| 17 | Lydecker Fine Art | U.S.A. | Unknown | Commerce | Art trading | National sales manager |
| 18 | Mgksolutions | U.S.A. | Unknown | Consulting | IT consulting | Systems administration |
| 19 | Mobizcorp | Berlin and U.S.A. | Unknown | Consulting | E-commerce consulting (partner of ePages, Intershop, demandware) | Senior software architect |
| 20 | Mokkafish | Jena / Taiwan | 7 | Software | Interface design, e-learning, own internet marketplaces | User interface design |

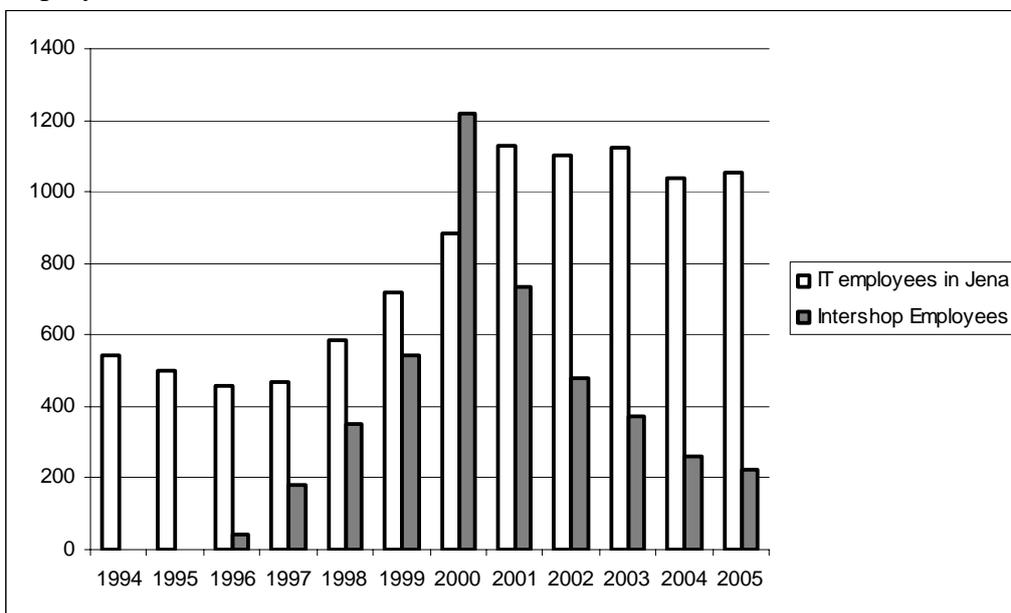
| | Firm name | Location | Jobs (ca.) | Industry | Business model / field of activity | Intershop position of (co-)founder(s) |
|----|--------------|--------------------|------------|-------------------------|---|--|
| 21 | Occasio | Leipzig and U.S.A. | Unknown | Software | Specialized content management systems | Manager Strategic Alliances / Sales Engineer |
| 22 | OMWave | Paris | Unknown | Consumer electronics | Home entertainment centers integrating computers and consumer electronics | Director Business Development |
| 23 | Pixundeins | Jena | 1 | PR agency | Web and graphic design | Graphical user interface design / storyboards |
| 24 | SEWAK | Jena | 5 | Software | | Procurement, web design |
| 25 | Synchronity | Jena | 21 | Software | Online software for banking / e-government applications; technical software | Project management; R&D (indirect spin-off – was IT manager of bank after Intershop) |
| 26 | TimeSpin | Jena | 6 | Webdesign and software | Webdesign, advertising, content management systems | unknown |
| 27 | Tourevo | Jena | 4 | Software | Online software for travel agencies | Customer relation management |
| 28 | TowerConsult | Jena | 12 | Software and consulting | Human resource consulting (recruiting); software development | VP Human resources |
| 29 | Tower PR | Jena | 2 | PR agency | | Company spokesman |
| 30 | Xceptance | Jena | 6 | Software | Quality management for software development | (1) Quality control (2) Legal counseling |

Figure 1: Development of the Intershop Communications AG stock price (source: www.onvista.com)



* The bars represent the average stock prices in that quarter of the year based on the stock prices on the first days of each month in the quarter.

Figure 2: IT employees in Jena and the number of Intershop employees (source: IAB Employment Statistics)



* Note that not all Intershop employees are classified as IT employees and that they were not all located in Jena.