Beyond Old Economy – New Economy Dualism: Urban embeddedness of current innovation processes

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Abstract

The present paper claims that the so-called 'old' and 'new economy' are complementary elements of an innovation process, not separate and opposite economic spheres. The urban bias of both internet-related services and economic internet use should be explained within this analytical framework.

Small internet-related service companies profit from higher flexibility and sensitivity for new technologies. Large established companies therefore largely rely on external innovation work. The role of both groups in the adoption of the internet for economic use is being examined. It is illustrated by preliminary empirical findings from interviews with employees and case studies on firms. A concept of this specific innovation process is being formulated, mainly taking into account the particular organisational patterns. In the outlook on the author's further research, it serves as a basis for hypotheses concerning the spatial embeddedness of internet-related innovation.

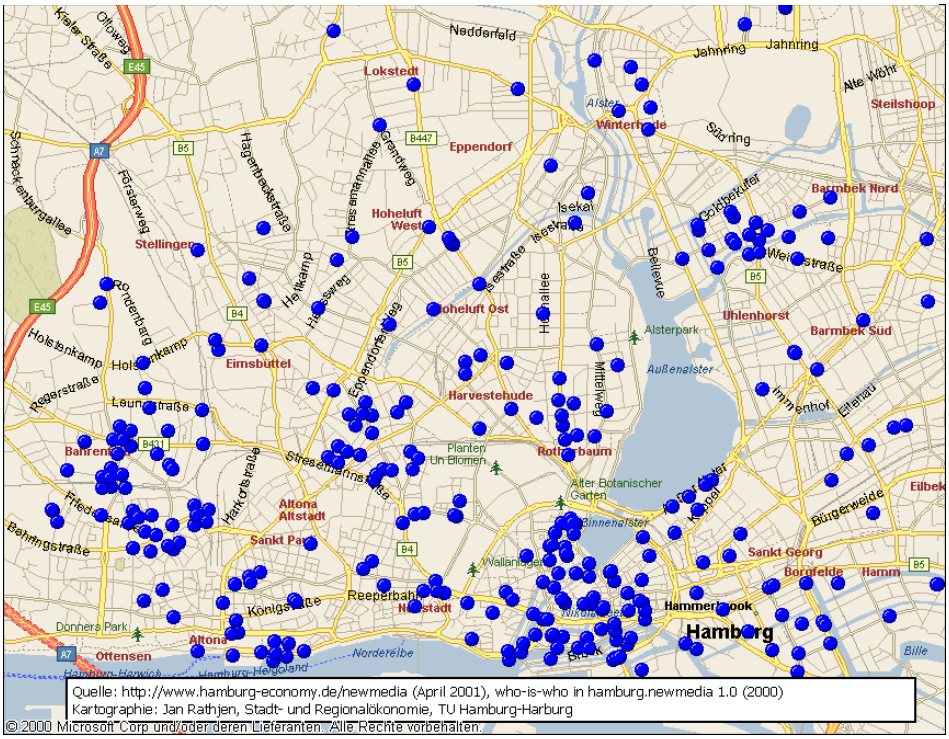
"…it's always important to pause, take a cold shower and ask yourself, 'OK, that's a really exciting possibility. Is it what's really happening in practise?"

Paul Krugman in Kelly 1998

Introduction

Until a bit more than one year ago, the Internet was said to change radically our economy, our work and our cities. The debate on profound and comprehensive change seemed to be as lively as the new economy stock exchange-segment. The emergence of myriads of internet-based start-ups in our inner cities were linked to debates on a "new economy", for which new rules applied, on a macro level as well as on the level of the individual firm and within the production process. Kevin Kelly's "New Rules for the New Economy" may serve as an example of the opposition between the traditional economy on the one hand and the emerging 'counter-world' on the other (Kelly 1997, Cooke 2001: 963,4 citing Kelly and Kaplan's "New Economy Conventions").

Figure 1: Spatial Concentration of multimedia and internet firms in Hamburg



Ideas about the role of space varied between its disappearance (Negroponte 1997), the rise of a new city of leisure and conviviality (Cairncross 1997) to a new importance of cities as an essential substrate for new economy firms (Scott 1998; Egan, Saxenian

1999; Pratt 2000 among others). The latter analyzed the metropolitan and inner city concentration of small firms dealing with multimedia- and internet-technology application (cf. fig. 1). Their dependence on, or embeddedness in, the city is perceived, then, as a chance for a sustainable revival of the inner cities and of compact and mixed-use settlement structures in general.

Was there a new economic counter-world emerging, characterised by ever increasing returns, highly motivated creative labour force, intensive networking and a remarkable preference for the city?

During the last one-and-a-half year, optimism about a "new economy" has decreased sharply (cf. fig. 2). So-called new economy firms have been facing declining demand, difficulties in access to new capital and, last but not least, management failures. Employees speak about burn-out and frustration rather than about identifying with the firm. And many novel business plans failed as soon as capital inflow ceased. At the same time, however, internet applications in the economy have become more and more complex, covering more and more steps of the production process. Established 'old economy' companies even employ an increasing number of internet experts by themselves. How can we explain this simultaneity of a bursting economic bubble on the one hand and an increasing interest in more and more differentiated internet applications on the other?

Figure 2: Evolution of German index of new technologies' stocks (Deutsche Börse 2002)

Given this somewhat contradictory evidence, we consider that the 'new economy' should not be conceived as a counter-world. Instead, we claim that we currently 'simply' witness a comprehensive innovation process, and that the emergence of new companies, their particular structures and their location can be understood from that point of view. This new perspective shall allow us to analyse conditions, especially spatial ones, of this current innovation process.

In a first step, we will discuss concepts of innovation and apply them to the process initiated by internet-related technologies and their economic use. The emergence of the "new economy" in terms of numerous start-ups can easily be understood if we consider

the respective strengths and weaknesses of large, traditional companies on the one hand and flexible and dynamic start-ups on the other. Thus, the supposed 'counter-world' can be interpreted as a kind of 'externalised R&D-milieu'. This will be the second part of our paper. Finally, the obvious urban character of the presumed 'counter-world' can then be re-interpreted from the point of view of spatial innovation research. The aim of our research is to analyse the role of the city in this specific innovation process. We will conclude on first hypotheses on this issue and give an outlook on our further research.

We will accompany our arguments by empirical findings resulting from corporate case-studies and interviews with employees in internet-related jobs. The aim of the empirical approach is to trace this specific internet-related innovation process and to reveal its external conditions, especially in terms of urban embeddedness. This empirical perspective is for illustrative purposes rather than being 'valid' empirical results. It will be completed and diversified during our further research.

Internet and Innovation

Does it make sense to distinguish the so-called ‚old' and ‚new economy' when analysing the changes driven by internet technology? Is there one progressive part of the economy and another one that is stagnating or even regressive? Or should we rather think in terms of only one comprehensive process that underlies these phenomena?

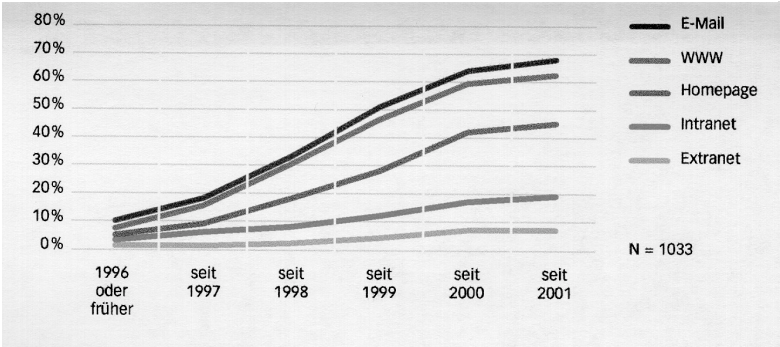
A comprehensive view is necessary

First, it is interesting to note that most internet-related start-ups are business service companies. Lutz Krafft has probably established the most extensive database on internet- and multimedia start-ups in Germany ($n \approx 9{,}000$). He distinguishes companies offering products and services via internet (information, e-commerce etc., 'dot-coms'), internet-related service companies (Agencies, Internet Service Providers etc.) and enabling technology firms (Software, Telecommunications etc.). Service companies represent 78% of the start-ups, 6% are mainly dealing with enabling technology, and only 16% are running an internet-based business by themselves (Krafft 2000). Thus the famous 'new economy' firms appear to be primarily a business service industry, thus producing inputs for other value chains.

Second, if we look at the structure of internet use in firms, we will find that it is mainly and increasingly rooted in the 'old economy'. They appear to be the main customers of the internet service companies: Again, no official data is available. A market study by a business consultant in cooperation with a German employer's

association provides us with data from 371 German firms (KPMG/BDA 2000). A Swiss study by a specialised magazine and the University of Bern in cooperation with the Swiss federal bureau of statistics has addressed 3859 companies with a return of 26,8% (Netzwoche 2001). The Swiss study is a representative survey (sector and firm size), the German one, without being formally representative, uses a firm panel that has proved in the past "to give a good idea of the economy's estimations", according to the authors (KPMG/BDA 2001:6). According to the reports, 84% resp. 90% of the total firms are using the internet. Concerning the different applications used, simple functions like E-mail, WWW-use and a firm homepage for customer information are far more frequent than more complex e-commerce or e-business applications (KPMG/BDA 2000; Netzwoche 2001; in line with other market studies: Genuity 2001; Putz & Partner 2001). In a dynamic view, E-mail and WWW-use seem to approach a limit of saturation whereas more complex e-business applications are still rising (Netzwoche 2001, cf. fig. 3). Even though media, information technology and telecommunication industries are most advanced (Putz & Partner 2001) it becomes clear that internet use affects the economy as a whole.

Figure 3: Types of internet-use in Swiss firms (Netzwoche 2001:4)

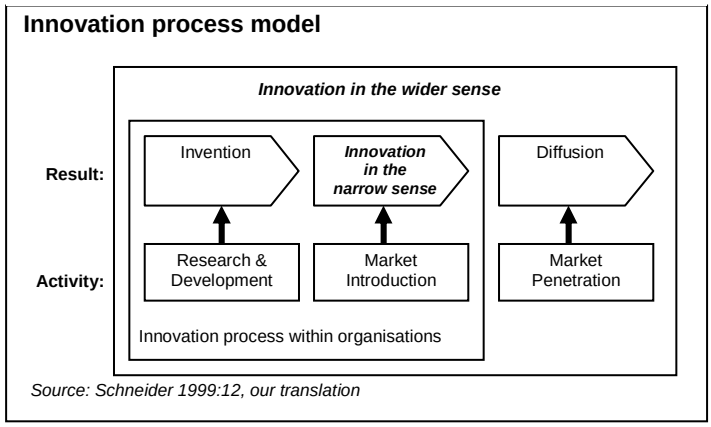


Technical change that penetrates and restructures the economy has been of growing interest in the last decades. Debates on innovation process, its structure and its conditions will help us to conceptualize the phenomena we intend to analyse.

Innovation theory and the rise of internet applications

How can we describe the evolution of the internet-technology and its use in terms of innovation?

Figure 4: Innovation process model



Source: Schneider 1999:12, our translation

It is remarkable to realize that numerous authors write about innovation without any explicit definition. Implicitly, innovation is defined by technical or organisational change in the economic process. Heunks defines innovation as "the successful technical and economic implementation of a creation" (1998:264). Thus, invention can be distinguished from innovation: It provides the idea of a new product or process, an economic opportunity, but does not include its technical and economic implementation. Innovation thus means translating a new technological or organisational opportunity into economically desired applications. Schneider provides a broader vision of innovation by distinguishing three steps, i.e. invention, innovation in the narrow sense and diffusion (1997:12, cf. fig. 4). Here, "diffusion" means market penetration in general, whereas spatial science would concentrate on geographic dispersion (e.g. Davelaar, Nijkamp 1997:25-31).

Today's internet applications are based on several **inventions** (Wise 2000). We will pass over the enabling technologies such as programmable computers, software, telecommunication etc. and concentrate on internet-specific aspects:

- Decentralised computer networks, deriving from the US-government co-funded Arpanet. Common transmission standards (IP) and more productive telecommunication networks were important steps in development (69-74).
- Digital formats for various types of media content, i.e. text, images, sounds etc., allowing for multimedia-applications in the strict sense. They partly also originate in military applications, mainly simulation of projectile trajectories, but also in the film industry, esp. special effects and animated films (9-23).
- The World Wide Web (WWW) user interface based on Hypertext-Markup-Language (html), developed for internal use in the European Centre for Nuclear Research, Geneva. Only the first successful web-Browser "Mosaic" finally opened the internet to the large public. It was developed in a US national research institute by the later founders of Netscape (74-75).

It can be concluded that the basic inventions originated in non-profit contexts of public-funded research and development. The latest inventions, i.e. the WWW, html (resp. its release for free use) and the Browser date from the early 90s. Only then the "technical and economic implementation" (Heunks 1998:264) could start, that is the search for economically reasonable applications.

E-Mail and WWW-use were the first applications in firms and are still the most frequent (cf. fig. 3), like in private use. More complex applications involving transactions among firms or with customers or digitalisation of business processes followed. More or less novel applications are being developed, driven by increasing experience among service companies and their clients, increasing knowledge of what might be effective, but also by increasing internet use among partners and customers of the internet-using firm. This qualitative evolution of internet use and the services delivered represent the actual **innovation process**. Growing internet use in firms in quantitative terms, however, can be seen as the **diffusion process**, i.e. dispersion of new internet-based products and services in the market for business applications.

Innovation can lead to new products (**product innovation**) as well as to modified or new business processes (**process innovation)**, without necessarily changing the output. The aim of the latter to rise efficiency and thus to obtain advantages in price competition. Product innovation, on the other hand, aims at creating unique selling propositions and thereby to realize monopoly profits, either through technical advance on competitors or by finding market niches (Porter 1998). Growing Internet use in firms mostly implies process innovation, i.e. new instruments in e.g. public relations, marketing, sales and after-sales services, but also new internal processes which are supposed to be more efficient. The term "E-business" means an integrated approach for more efficient business processes based on internet and internet-related technologies. New products also emerge, mainly based on the commercialisation of information.

This quite linear concept of innovation leading from laboratories to implementation and market penetration has been criticized, or rather completed, during the last decades (Cooke 2001:945,7; Tödtling, Kaufmann 2001:203,4). Research too often

> "uncritically internalized autobiographical accounts by famous scientists. They stressed the logical progression of discovery from theory to experiment, confirmation to validation and science to technology, but left many puzzles, not least how change occurred." (Cooke 2001:945)

On the one hand, a closer look on actors revealed the importance of **inner-firm micro-politics** that determine to a large extent the innovation process. On the other hand, innovation is increasingly perceived as being embedded in a whole **network** of actors

beyond the single firm. Here, we find debates on innovative milieus and regional innovation systems (Camagni 1991; Braczyk, Cooke, Heidenreich 1998; Cooke 2001).

Finally, non-linearity also implies roundabout ways and dead ends as well as unexpected success. Innovation implies **uncertainty and risk of failure**, and even though practise and theory are searching for remedies, these can only be limited, not eliminated. Cases of unexpected success can also be observed, e.g. the extensive use of SMS messaging that has not been foreseen by the mobile telecommunication companies.

We will use the innovation process model in spite of the above mentioned criticism because it provides us a practical framework for dynamic analysis. Our focus on complementarities between small business service companies on the one hand and large internet-using firms on the other is even closely related to those criticisms. Here we add a view on organisational issues. And as to dead ends in innovation processes, we will inevitably encounter numerous examples of them when analysing the development of economic internet use…

„New Economy“ – just the old economy's external 'innovation unit'?

One very striking issue about the internet-driven innovation process is the strong reliance of established companies on external service companies, start-ups for the most part:

There is hardly any reliable quantitative evidence on this new sector. Official statistics do not capture it well and other sources use different definitions and – especially in the case of market studies – risk being biased. Nevertheless, it can be stated that small start-ups account for the most part of the internet-related work in Germany: According to estimates of the principle German trade association (dmmv) in co-operation with a specialist editor, this new service sector accounts for the largest part of internet-related jobs, estimated to about 50% or 100,000 jobs in 2001 (Interview Goertz, dmmv), with another 100,000 in traditional firms of the 'old economy'. Krafft, based on his above mentioned survey, estimates 98,600 employees in the internet-related service-sector, i.e. 8.6 employees per firm. Multimedia-agencies are smaller than other firms of this sector, i.e. 6.7 employees per firm. He estimates that another 50,000 to 100,000 internet-related jobs are situated in established, 'old economy' companies. Even though these estimates are very vague, it can be stated that internet work is

situated to a large extent outside the actual applying companies, namely in start-ups specialised on internet technology application.

On the other hand, it is clear that most internet application is realized in the 'old economy', that is in established companies of more or less all sectors. How can we explain this phenomenon of externalised innovation work?

During the last decades and especially in the 1980s and early 1990s there has been growing interest in structures and conditions of innovation processes and strategies (e.g. Freeman 1986, Freeman 1990, Dosi et al. 1988). Within this strand of literature, the respective roles of small and large enterprises in former innovation processes have been studied (Olleros, Macdonald 1988; Rothwell 1986; Rothwell 1989; Rothwell, Dodgson 1996) highlighting their complementary character. These accounts help us to re-interpret the 'new-economy' sector as a kind of 'externalised innovation unit' of the economy as a whole.

Externalising innovation activities

According to Olleros and Macdonald (1988), externalisation of innovation has evolved during the last decades, for being an efficient organisational pattern. They identify a historical succession of different organisational patterns applied by enterprises, notwithstanding that they might also occur simultaneously: Investment in corporate Research and Development (R&D) was increased from the 1960s on, first by establishing ordinary R&D departments. However, due to organisational and cultural rigidities, firms often were unable to provide their R&D-personnel with attractive, i.e. liberal, working conditions and to adopt their own creations. Numerous spin-offs and thereby the loss of valuable knowledge were the result ("incubator syndrome", 156). In order to overcome organisational and cultural rigidities particular management structures were established for R&D units from the 1970 on. The units were given more autonomy than other firm units ("internal venture", 159, 60). But still, their need for autonomy tended to be underestimated within the traditional decision structures, and "internal ventures" risked failing as half-hearted experiments. Conscience of the complementary qualities of small and large enterprises in the innovation process grew, and "external alliances" with specialised young and small firms emerged during the 1980s.

Externalising innovation can take **different forms**: Whereas Olleros and Macdonald understand by "strategic alliances" different types of formal inter-firm links explicitly

focused on R&D, Rothwell and Dodgson (1996:322) have a broader vision, including e.g. “Producer/consumer relationships” or first customer relationships.

In his analysis of a British innovation database and of the evolution of the computer and CAD industries, Rothwell (1986, 1989; Rothwell, Dodgson 1996) finds that the role of “new technology based” SMEs in the innovation process must be differentiated according to the **sector**. Industries with low entry costs and important use of skilled labour are more likely to see important innovation by SMEs (e.g. computer equipments rather than industrial machinery).

Furthermore, he finds that the respective roles of SMEs and large, established companies vary along the **innovation cycle**: Large enterprises are more likely to produce inventions due to higher R&D expenditure and formal research units. SME start-ups, however, are more likely to find novel and economically viable applications, even outside the original economic sector. Referring to our definitions in the preceding section, we may identify these steps to the innovation and the diffusion phase. With maturing technology and increasingly specified market requirements, innovation will be on more efficient processes rather than on the product itself. Large enterprises will dominate again due to economies of scale and realize process innovation and minor product innovation in co-operation with external services. SMEs may keep certain significance if market niches appear (Rothwell 1986:234-7; 1989:57-60; Rothwell, Dodgson 1996:313,4,18-21).

If there is empirical evidence for complementarities between small and large, young and established firms, how can they be explained? Rothwell resp. Rothwell and Dodgson give an extensive overview of advantages and disadvantages of both types of companies in the innovation process. They conclude that large firms profit from their financial, technological and organisational resources, i.e. from “*material* advantages” whereas small firms have “*behavioural* advantages”, i.e. “entrepreneurial dynamism, internal flexibility and responsiveness to changing circumstances” (Rothwell, Dodgson 1996:310; emphasis by the authors). Olleros and Macdonald (1988) explain the use of innovation alliances between small firms on the one hand and large, established firms on the other, putting forward three aspects (168,9):

- ***Responsiveness*** to changes and new opportunities which is higher in small firms: These combine organisational flexibility with “single-mindedness” (168), i.e. concentration on the new technology, its evolution and its application. Large, established firms on the other hand provide a more rigid organisation and

corporate culture and a larger range of functions (marketing, production etc.), favourable rather for efficient production and commercialisation than for fundamental innovation.

- ***Risk-taking***, i.e. SMEs are better up to the risk residing in new technologies and the search for their efficient use in the economic process: This is due to their specialisation on this technology, on the one hand, and their more flexible and risk-oriented management.
- ***Leverage on resources***, i.e. more efficiency and higher control in the use of resources as far as the large and established firm is concerned: It profits from the small firm's resources, esp. knowledge, without employing too much of its own manpower. Resources for research grants, the commission of services etc. are easier to control, and can be redirected if necessary or even be split in order to follow several paths at the same time.

Our examples of two internet experts and their new economy- and old economy-employers may give us some insight in how far – and if yes, in which way – these considerations apply to the innovation process induced by the internet.

Organisational aspects in two empirical examples

In order to analyse organisational aspects of the internet-related innovation process, its external conditions and especially its urban embeddedness, our empirical work is on individual firms and their 'ways to the internet'. For the present paper we will focus on complementarities between small specialized business service companies on the one hand and large, internet-using firms on the other.

Our methodological approach is largely inspired by the work of van Geenhuizen. She analyses innovation adoption by Dutch textile firms in order to complement research on regional innovativeness (Geenhuizen 1993; Geenhuizen, Nijkamp, Townroe 1992; Geenhuizen, Nijkamp 1997). Her method is "Company Life History Analysis" (with reference to Schoenberger 1991), a qualitative, micro-analytical approach of individual firms. It comprises longitudinal analysis of business strategies, organisational patterns and key decisions. She adopts a long-term perspective because she considers business evolution and especially receptiveness for innovation in an evolutionary context with reference to Nelson and Winter. Data comes from in-depth interviews with corporate representatives, annual reports of the firms and external sources such as journals, specialized magazines etc. (Geenhuizen 1997:281,2).

So far we interviewed employees of 'old economy' companies responsible for internet applications within their firms and who are thus 'in the centre' of the innovation-adoption process. On the other hand, our interviewees have been working in internet agencies before. Their career should allow us to trace and to analyse the innovation process – except for invention – ranging from the pioneering agencies to the internet-using companies. The centres of interest of the interviews were the evolution of the interviewees' internet-related work, their personal learning process and their working conditions in both types of firms. In order to supplement the employees' perspective, we studied the evolution and the corporate strategy of the two internet agencies as well as of the 'old economy' firms involved. Here, data comes from press releases, journals, specialized magazines, online-newsletters and interviews with branch experts. The following table provides key information about the interviewees:

Table 1: Job-related Biographies of interviewees

<table>
<tr><th>Year</th><th>Michael Z.</th><th>John S.</th></tr>
<tr><td>Before 1996</td><td rowspan="3">Student in business administration in B-town.</td><td></td></tr>
<tr><td>1996</td><td rowspan="3">Apprenticeship with the classical advertising agency GN in D-town.</td></tr>
<tr><td>1997</td></tr>
<tr><td rowspan="2">1998</td><td rowspan="3">Job and trainee with W Electricity in B-town, department for telecommunications, mainly on internet issues.</td></tr>
<tr><td>Job in the M-town branch of the GN network.</td></tr>
<tr><td>1999</td><td rowspan="3">Change of job to the internet agency First Media, project manager. Project for AM Machinery.</td></tr>
<tr><td>2000</td><td rowspan="2">Change of job to the M-town branch of the internet agency A-media, project manager.</td></tr>
<tr><td rowspan="3">2001</td></tr>
<tr><td>Closing down of the agency's M-town branch, jobless for a short period.</td><td rowspan="3">Insolvency of First Media, takeover of the entire unit by CSI. Work still exclusively for AM Machinery.</td></tr>
<tr><td rowspan="2">New Job with B-Textiles, M-town, project manager e-business.</td></tr>
<tr><td>2002</td></tr>
<tr><td></td><td></td><td>Change of job to AM Machinery in H-town, customer relationship management.</td></tr>
</table>

N.B. All names have been changed. Any similarities to real persons or firms are not intended.

The histories of both agencies and of both 'old economy' firms reflect the supposed complementarities between these types of companies.

A-Media and First Media both deliver internet-related services to established firms or – to a lower extent – so-called dotcoms. Most of their turnover stems from these services, other activities (see below) have always been of minor importance. Their

founders originate in marketing and advertisement agencies, in both cases combined with market research. None of the agencies has contributed to the basic technologies described in the first section. Their portfolios have evolved over time, ranging from simple firm information in the web (public relations, marketing) to more or less complex e-business solutions. Thus, the agencies' role has been, and still is, more or less incremental **innovation** in internet applications and especially **diffusion** of internet applications into the economy as a whole.

For both agencies long-standing complementary relationships to established companies can be found in which established companies intend to profit from external expertise: For both agencies, like for many others, strong **"first customers"** can be identified, that have accompanied – and financed – their rise. First Media's first customers had already worked with its founder in his former job. So far we can only suppose that at least part of these "first customers" deliberately promoted the agencies' development. Interviews with 'old economy' firms shall provide us further evidence on this point. A-media had several **joint ventures**, e.g. an incubator with a large "old economy" firm interested in innovative e-commerce applications. Another example is a marketing society conjointly founded with a new electricity company for her introduction to the market. First Media ran sports portals in a joint venture with a traditional sports marketing society.

Both of the "old economy" enterprises did not employ internet-experts before Michael Z. resp. John S. Knowledge on the new technology and its use was scattered among several people and still is scarce today. Even after employing Michael Z. resp. John S., both firms will continue to rely on external internet service companies.

Did low entry cost and important use of skilled labour favour the emergence of the two internet agencies? The low entry cost-argument put forward by Rothwell and Rothwell, Dodgson is drawn from manufacturing industries and seems less valid for services. Investment is in personnel, to a lower extent in marketing. Entry cost was rather about technological knowledge – html is easy to learn –, access to "first clients" and to labour force. Concerning the agency's presumed attractiveness for skilled people, accounts dating from the late 1990s and the year 2000 showed that **employees were highly identified** with their employers. In today's interviews, however, they rather express how relieved they are to have escaped from those stressful times. Their main concern now is their disappointment and their wish for regular working conditions.

Responsiveness

The internet as such and the development of its possible uses was exclusively the agencies' affair, at least in the late 90s. "The customers didn't know anything. You could tell them anything you wanted" (John S.). Later on clients were better informed and more demanding. Due to changing user behaviour, websites had to be more interactive and more entertaining than were the simple presentations of the first generation. From 2000 on, both agencies tried to position themselves as e-business specialists, still 'responding' to a developing market. Curiously however, both internet-experts do not perceive a change in their work but rather a "general tendency towards more demanding clients" (Michael Z., also John S.). Learning was learning by doing, none of them ever took part in a formal further education seminar except for brief trainings in new software for John S. He even states he was so busy with his everyday-work that he "could not find innovative approaches". Michael Z., however, finds one example of innovation he witnessed in his agency: A-media employed some leading programmers of a certain browser plug-in, and got to know their innovative solutions immediately. "We were part of the internet world" (Michael Z.), progress in this case was transmitted by colleagues, seemingly in a diffuse, atmospherical way that is difficult to reflect.

Both experts speak of flexible structures in the agencies, but in a rather negative way: Managers did not assume their leading roles, new employees were given hardly any introduction to their work, and corporate structures were poor in general. Work was more autonomous, indeed, than with the established firms, and nowadays Michael Z. perceives those extraordinary challenges also as helpful experiences. But in general, both interviewees nowadays have a very sceptical attitude: "You cannot imagine how things went in the new economy … it was a good time, but I'm glad it's over" (Michael Z.).

His present 'old economy' employer still is quite ignorant or even hostile towards internet and e-business although B Textiles already has a certain experience with computer-aided business processes: A part of its activity is renting specialized textiles, and the company has introduced microchips to identify the items when they return to the company. This system is going to be integrated in the comprehensive e-business system he is supposed to introduce. Nevertheless, he feels like an "internal consultant", and he is facing decision structures that make his task – identifying possible e-business-applications within his new firm – a complex, micro-political process. John S. could

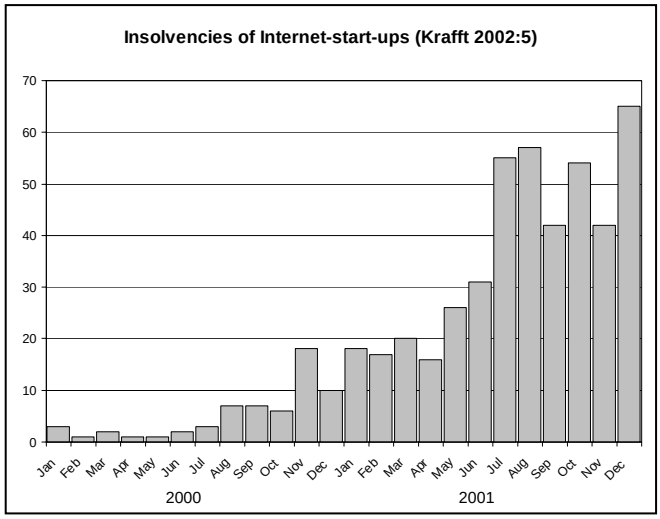
only be employed in the marketing department of a large machinery company after half a year of internal procedures leading to the establishment of his job. His experience in this new job is too short to identify innovation barriers.

In our examples, it is, indeed, the agencies that implement and develop economic internet applications according to market opportunities and requirements. The established firms even nowadays are very sceptical or reluctant to implement internet applications.

Risk-taking

Both agencies have been facing serious difficulties during the last one and a half year. A-Media closed down its branch in M-town, First Media even went bankrupt. Both interviewees estimate that too rapid growth and a lack of managerial competence are important reasons. John S's agency ran joint venture internet portals, beside its service activities, which then failed. Both agencies, leading firms in their branch, are quite typical of the branch in the whole (cf. fig. 5). Maybe Olleros and Macdonald's (1988) efficiency argument concerning risk-taking by the SME should be read in a different way: Established firms did not only externalise innovation activities, but also innovation risks, i.e. the risk to invest into internet applications that turn out to be unprofitable.

Figure 5: Insolvencies of German internet-start-ups



Thus, interfirm linkages between large, established firms on the one hand and small, new technology-centred firms, on the other, are not only expression of functional complementarities, but also of power.

Leverage on resources

This leads to the third argument, i.e. more efficient employment and control of resources by commissioning services to external companies instead of developing new competencies within the large firm. So far, we have little evidence of such motivations within the internet-using firms. Both established companies have been relying almost

exclusively on external internet expertise. John S's new employer profited from this flexible arrangement by changing its internet agency and delivered several small projects to different firms in order to test them.

Conceptual issues

Even from our restricted empirical basis some issues arise that indicate conceptual shortcomings.

Innovation or ordinary consultancy work?

On the one hand, we see that internet agencies play a crucial role in the implementation of novel internet applications and thus modified business structures. On the other hand, we learn that from the inside, the agency is not perceived as an innovative working context: According to John S., employees have no time for innovative work; he hardly perceives changes in the solutions provided to the customers. And Michael Z. experiences undefined business structures as an obstacle to effective work rather than as a precious freedom, even in contrast to hierarchical and complex decision structures in his present job. The contrast may partly be explained by bad souvenirs of both interviewees and too short branch experience in the case of Michael Z. But it also makes clear that innovation is highly subjective (Schneider 1999:8,9) and that everyday consultancy work for one side can mean radical innovation for the other:

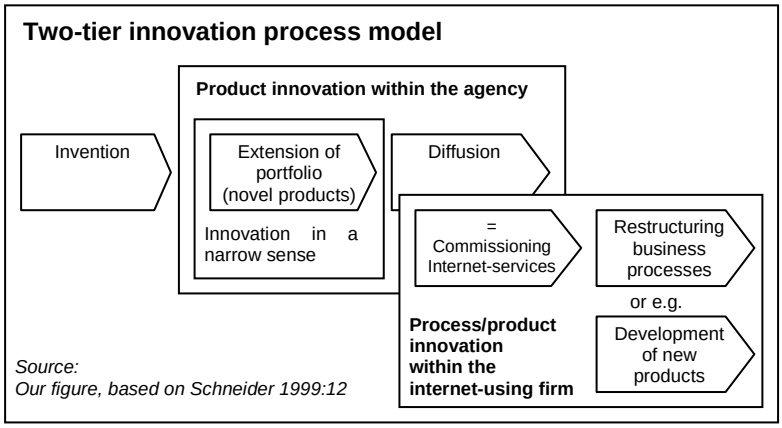
- **Innovation from the agencies point of view** is developing novel internet applications and especially the internal ability to offer them to clients (product innovation, e.g. from simple homepages to integrating transaction functions or even offering complex e-business solutions). Once these types of solutions are part of the agency's portfolio, each application is everyday work (diffusion, again from the agencies point of view).

  If John S. doesn't perceive changes in his personal work, but speaks about a "general tendency" towards more and more demanding internet users and clients, this corresponds quite well to Freeman's and Perez' description of incremental innovation. These are mostly the result of "'learning by doing' and 'learning by using'" (Freeman, Perez 1988:46), i.e. remarks and proposals of clients.
- **Innovation from the internet-using firm's point of view** can even mean introducing an e-business system that is little innovative from the agency's point of view. It is still new from the client's point of view; it changes business

processes, leads to limits in business organisation and culture and can mean a radical innovation to the established firm (process innovation).

Thus, we need to consider a **two-tier innovation process model** in the case of externalized innovation activities (cf. fig. 6): The agency's innovation process comprises the adoption of the internet technology and related competencies and the search for economically viable applications. As soon as the products, i.e. consultant jobs, penetrate into the market, i.e. the economy as a whole, this means diffusion from the agency's point of view. From the internet-using firm's point of view, this is only the input for the actual innovation process.

Figure 6: Two-tier innovation model



Our interviewees seem to have worked with the agencies just in the transition between innovation and everyday-work with only incremental innovation left to be done. Consultant jobs were no longer discoveries of unknown land but services for demanding customers. On the other hand, business structures were still those of the internal innovation phase where "nobody knew what to do, but in this, we were together" (another internet-conceptionist). Thus, the internet service branch seems to reach a certain maturity whereas 'old economy' firms might still face challenging innovation processes, with the help of external consultants.

Receptivity for innovation

Obviously relying exclusively on external knowledge poses problems to established firms. In this the hypotheses we adopted from former research may have been too optimistic. Michael Z's new employer had an expensive website made that finally provided no value-added because it was hardly integrated into the firm's internal processes and strategies. Thus, the internet was adopted in a superficial and inefficient way. The firm's consequence was to develop internal competencies, i.e. to employ one person exclusively for the creation and the implementation of an e-business strategy. John S's new employer also employs a specialist and keeps a specialised agency at the

same time. Anecdotic evidence and interviews with experts show that our interviewees' trajectories are typical of recent changes in the labour market: Many established firms have profited from the "new economy" crisis by employing jobless project managers coming from internet service companies. Neither Michael Z. nor John S. are supposed to replace external services, but to function as an interface between external expertise and the established firm itself.

Thus, complementarities between large and small firms are difficult to manage (cf. Doz 1988). Within the large firm, different departments might have **inconsistent attitudes**. Michael Z. finds allies within his IT department, to a lower extent in the marketing and corporate communication departments and hardly any comprehension in the operating units. John S's department realized the necessity to employ a specialist like him, but had to face internal problems with the management.

John S. speaks about arrogant attitudes of internet agencies towards their clients. Due to knowledge gaps between agencies and their clients the latter could hardly criticize their 'agents'. A badly implemented internet project is part of the reasons why Michael Z's present employer created his job. **Cultural distance and badly managed interfaces** hindered efficient innovation adoption.

A firm's receptiveness for innovation and interface management between external expertise and internal structures and processes are two issues to be integrated in an explanation of innovation processes.

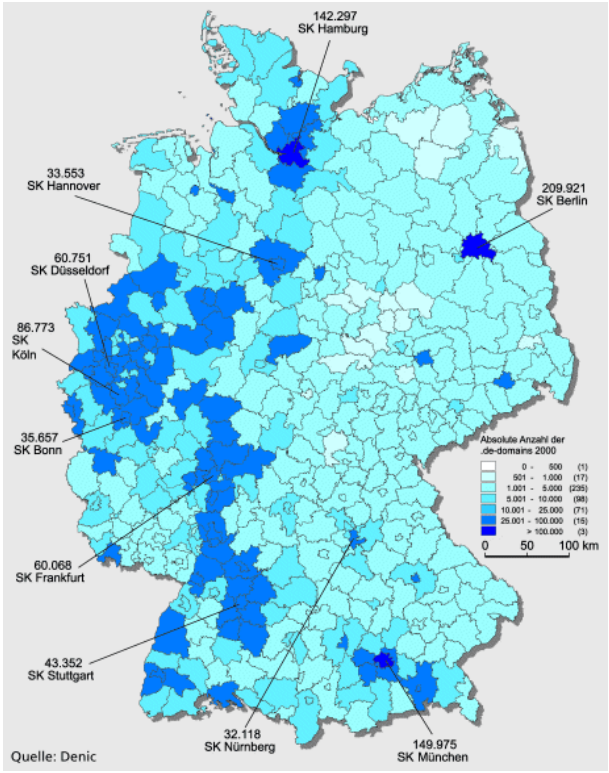
Outlook: The city as the locus of the internet-related innovation process

The general subject of our research is to analyse the city as a locus of innovation taking the example of the internet-related innovation process. The aim of this paper was to contribute to an analytical framework for the phenomena we observe conceiving of it as an interplay between small internet-related business service firms and large internet-using companies.

Correlating places of internet production and internet-use

Not only is the production of internet-applications concentrated in metropolitan regions and inner-city areas: Internet-use by firms also is. If we use domain-registration, i.e. reservation of catchy 'addresses' of websites, as an indicator for internet use, we can analyse the locational patterns of the registrating firms (in the case of .com-domains) to learn about the regions or places of economic internet-use (cf. fig. 7, 8).[i]

Figure 7: Concentration of business internet use in German metropolitan regions

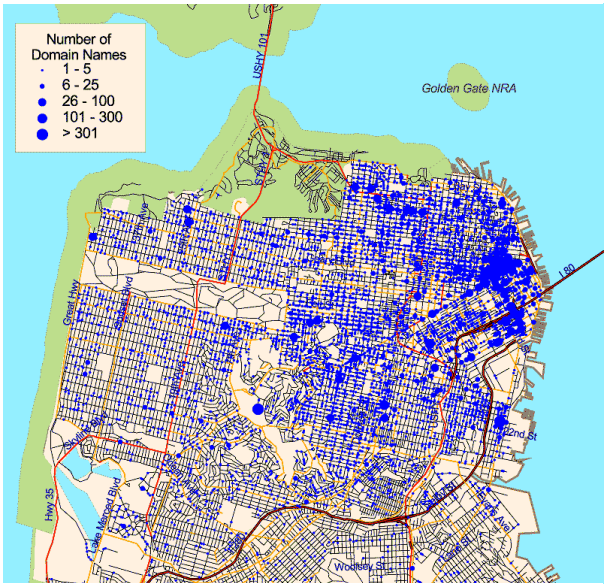


Source: www.horizont.de (27-9-2001)

Given this evidence on a spatial relation between the production of innovation and its adoption, how can this link be explained?

Spatial research on innovation

Figure 8: Inner-city concentration of business internet-use



by Matthew Zook (http://www.cybergeography.org/atlas/ zook_large.gif)

In recent years, spatial conditions of innovation have been of increasing interest, especially the issue of regional innovativeness. Innovation is conceived as an interactive process, involving various actors exchanging knowledge from very different sources. As the exchange of knowledge – especially of tacit knowledge – presupposes well working social relationships based on trust, cultural aspects of actors' networks are also part of the model. It is supposed that this "innovation system" has a territorial dimension that fosters the complex relationships described, even though it is not necessarily spatially integrated (Tödtling, Kaufmann

2001:203,4). From the individual firm's point of view, its context is given a crucial role in this approach. The firm's embeddedness in a certain institutional, social and cultural context is decisive for its capacity to innovate.

On this background – that will be extended in a different context – we will analyse the innovation process from the individual points of view of both types of firms:

The agency's way to the internet

How could the internet agency develop the competences to offer internet-related services to its clients? And especially: What role does the spatial context play, the city and/or the region? Literature on innovation and space will offer us hypotheses that need to be adapted to the service sector as most research on the issue deals with productive industries. The following subjects seem particularly important – again illustrated by our empirical findings:

- The link between the agency's trajectory and the development path of the city resp. the region.

The evolution of the firm and even of their founders before the firm's foundation must be examined and related to the city's resp. region's economic history. The link to evolutionary concepts of economic development is obvious. E.g. First Media is deeply rooted in B-town's tradition in the media and advertisement sector.

- The 'learning context' of the firm and of the individual employee, via formal co-operations, informal relationships, demanding clients or local / regional institutions, on the level of the firm as well as on the level of the individual employee.

External relations of the firms as well as of the employees must be analysed, especially in their role for acquiring new competences. Both employees state that they hardly ever took part in formal further education. Michael Z. for example speaks about his job to friends from other agencies, but not "seeking for advice". Here we can identify contacts, but it will be difficult to assess their significance for his learning process. John S. states that he is far less involved and "not interested" in the 'internet milieu' than others in his former agency were. The cultural dimension of milieu arises from this statement.

The internet-using firm's point of view

Deeper insights in ways of established firms 'to the internet' should give us hints on **spatial conditions of internet adoption**. M. van Geenhuizen finds that firm size and especially the firm's trajectory have a much stronger explanatory value for innovation receptiveness than proximity to the economic centre (Geenhuizen 1997). Distance,

however, can only be a first approach to spatial conditions of innovation. An analysis of social, cultural and institutional embeddedness into the city resp. the region could be far more fruitful. It could comprise e.g.:

- Intersecting networks in the city that provide established firms with contacts to internet services.

Thus, one of the main activities of the M-town development body was to inform 'old economy' companies about the development and the potential of internet-related technologies and applications. Networks were being created between established firms and start-ups. The role of venture capitalist, banks etc. (Cooke 2001) seems less obvious for B-town but might be a trace to be followed.

- Spatial proximity to the internet consultant.

The ways and the intensity of cooperation with the external consultant should indicate in how far face-to-face contact and thereby spatial proximity of client and service company are necessary.

- Manifold urban labour market.

Urban and esp. metropolitan labour markets make it easier to integrate internet experts and get access to branch-specific knowledge. Not only access to labour force with a preference for the city favours innovation in agglomerations. J. Thiel will state here that integration of new groups of employees with a different origin is also a cultural issue and might be easier within the cultural density of the city. B-textile profited from Michael Z's preference for M-town. He refused to leave it although he was offered to work for a branch of A-media elsewhere. John S. found his job via established networks, but which were not spatially integrated.

We have seen that internet-related service start-ups and internet-using firms, their clients, are part of an innovation system. Their obvious urban bias indicates that in this specific innovation process, urban and regional context plays a crucial role. Our approach should allow us to elaborate the role of the spatial context in this comprehensive process and add to the knowledge of the city as a locus of innovation.

Notes

[i] Mostly, locational data on domain-registration is used to analyse the conditions of Multimedia- and internet-related **production** (e.g. Zook 2000), but this would only apply if all user of internet domains produce their content by themselves. It can be stated, however, that this is true only for a – probably minor – part of domain registrating firms.

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