

The Social Dynamics of Expectations: The Interaction of Collective and Actor-Specific Expectations on Electronic Commerce and Interactive Television

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ABSTRACT *The article investigates three mechanisms by which expectation dynamics affect innovation processes. Empirically, it focuses on hype–disappointment cycles in electronic commerce and interactive television, drawing on results from qualitative case studies and secondary analysis. First, two specific ways by which collective, i.e. widely shared, expectations motivate and guide innovation actors are presented. These mechanisms serve as an explanation for the fact that often an impressively large number of heterogeneous actors accept and contribute to high-rising expectations. With reference to a third mechanism, it is shown that results of technological projects are subject to interpretative flexibility and, as such, are interpreted in the light of the same expectations they are supposed to ‘validate’. Sudden changes of the consideration of certain technologies as promising or not are then explained as a result of the interaction between collective expectations and expectations and outcomes at the project level.*

Introduction

New technologies are often subject to high-rising expectations. Typically expectations can be very widely accepted for a period of time by both supporters of a new technology and also critical voices resigned to the inevitability of a particular technology’s development. However, in some cases like interactive TV or e-commerce, expectations can be seen to have suffered from rather sudden collapse: a dynamic frequently referred to as the hype–disappointment cycle.¹

Expectation dynamics have a decisive impact on the pace and direction of innovation processes. They motivate heterogeneous actors such as business firms, policy actors, financial actors, NGOs and private investors to engage in promising innovation fields. Thereby

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expectations serve as coordination devices, both at the level of networks of co-operating actors as well as, more indirectly, between wider actors in an innovation field. Expectations also serve to create the protected spaces necessary for experimentation and learning in the context of precompetitive technologies.² Furthermore, expectations contribute to the shaping of technologies, particularly in the form of application scenarios or expectations referring to technological components. More generally, expectations channel efforts into certain directions and contribute to the emergence and stabilisation of socio-technical structures.³ Other viable options may then be neglected, thereby potentially contributing to early lock-in and path dependency.

Therefore, on the one hand, shared expectations play a central role in creating the necessary momentum for innovation processes and in the coordination of heterogeneous actors; on the other hand, they may also be highly problematic, when hype-cycles turn into disappointment phases, often having a detrimental effect on the credibility of specific actors or an innovation field,⁴ or if widely accepted expectations are no longer subject to critical examination.

Taking these findings from science and technology studies as a starting point, this article focuses on the micro-level social dynamics of expectations. It analyses how widely shared expectations motivate and guide innovation actors (the *social* dynamics of expectations) and investigates the dynamics underlying sudden changes of expectations (social *dynamics* of expectations). In this way the paper contributes to the sociology of expectations and Brown and Michael's⁵ structural perspective in which they analyse expectations in relation to the positioning of actors and their temporal and spatial 'situatedness' within networks. Drawing on phenomenological sociology and symbolic interactionism, the paper adopts an interactionist perspective considering specifically actors' expectations in their relation to expectations of others.

The recurrent phenomenon of hype–disappointment cycles prompts two key questions: first, how is it that expectations are able to draw together such large numbers of highly heterogeneous actors, and how is it that such actors come to subscribe to expectations that may be fundamentally contrary to their interests? Research has recurrently pointed out that expectations are strategically distributed and partly inflated by the requirement to attract resources (see below). What remains unanswered is why many actors may participate in such spirals of hype whilst not necessarily sharing an interest in contributing to these expectations. My second question relates to the rapidity and suddenness of changing expectations. Does a loss of confidence arise from new and better knowledge about the performance of a technology? As will be shown, this explanation can only be part of the answer.

This paper provides some answers to these questions based on two empirical studies in the field of telecommunications: e-commerce and interactive television. In the 1990s, expectations of possible future growth markets clustered around the potential of new information and communication technologies, and in the first half of the decade high expectations concentrated on interactive television. Interactive TV refers to television enhanced by a backchannel, enabling services like video-on-demand, allowing users to order videos, or participate in teleshopping, telelearning or telegames.

In the second half of the decade expectations tended to cluster around the potential of electronic commerce referring to various applications that support information, communication and transaction between companies, retailers, public authorities and consumers using the Internet. Expectations of e-commerce peaked at the very end of the 1990s followed by a rather sudden downturn after the collapse of the newly established Internet

sector of the stock market, the so-called 'dot.com-bubble'. Empirically, this article draws largely on qualitative material, partly based on research conducted by the author and partly based on secondary analysis. Qualitative results are complemented by quantitative studies allowing for some wider generalisation.

In what follows, the concept of expectations as an emergent product of social interaction is presented. Then specific ways are described by which expectations that are widely shared in a societal field motivate and guide innovation actors. The current state of the realization of expectations, e.g. results of technological projects, is then shown to be subject to a high degree of interpretative flexibility. After this, the interplay between expectations on the level of an innovation field and on the micro-level of technological projects is investigated. It is argued that this interplay may contribute to the well-known hype–disappointment dynamic.

Expectation Dynamics as a Social Process

This paper takes as its starting point the assumption that individual as well as collective expectations are an emergent product of social interaction. This theoretical perspective will help us to conceive expectations as a social construct and to see how actors relate not only to their own expectations but to those of others. Before exploring in more detail what this means, I will explain the distinction between individual and collective expectations.

Clearly, individual expectations are those that can be said to be held by and attributable to individual actors. Similarly, there are expectations shared by specific groups of actors that are also attributable to these actors. Both will be called *specific expectations* in what follows. *Collective expectations* then refer to expectations that are not attributable to specific actors or groups of actors. In that sense, drawing on the tradition of symbolic interactionism, collective expectations may be considered to be the expectations of generalised others.⁶ Collective expectations are not only shared by a large number of actors, they are part of a generalised and taken-for-granted social repertoire. They have become a depersonalized social construction—a *fait social*.⁷ Actors refer to them and take them into account and assume that other actors share these expectations or, at least, that they are aware of them and will also take them into account. This is not a specific characteristic of expectations in science and technology, but a ubiquitous feature of social expectations, e.g. expectations as part of role expectations structuring social interaction more generally.⁸

Collective expectations emerge as a result of the exchange of expectations between large numbers of actors. Expectations are mediated in societal discourse; either public discourse represented in mass media or discourse about specific technological fields. In addition, innovation activities—e.g. the development, production or application of a technology—contribute to the formation of collective expectations and function as a materialised indicator of expectations.⁹ By implication, while on the one hand innovation actors are guided by their specific and by collective expectations, on the other hand they contribute to the formation of collective expectations, either by discourse activities, e.g. press releases, publications, giving interviews or conference presentations, or by innovation activities¹⁰ (see Figure 1).

Individual expectations also result from social interaction. The expectations an actor holds and communicates are based on the exchange of expectations in direct and mediated interaction with many others. Therefore expectations are consciously and subconsciously continuously adjusted to the specific expectations of other actors and to collective

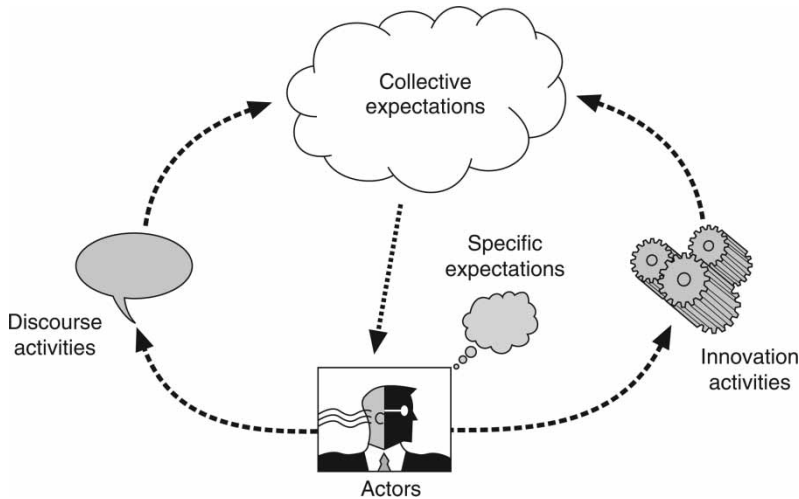


Figure 1. The relationship between actors' activities and collective expectations

expectations.¹¹ Individual expectations are also formed by the specific position and the specific interests of an actor (see below), but cannot be explained by this alone.

Hence, even if individual or collective actors influence collective expectations, they are themselves subject to the influence of collective expectations. Therefore, when analysing expectation dynamics, we have to be careful not to focus too much on the strategic dissemination and inflation of expectations. This is but one, though very important, explanatory element of expectation dynamics. However, the strategic perspective tends to see the construction of expectations rather as a one-way process than as a process of continuous exchange of expectations.

The importance of expectations as a strategic resource for action has been shown by various authors.¹² Expectations are strategically spread and sometimes inflated by some actors to attract resources for their innovation activities, to enrol partners or consumers thereby supporting the formation of innovation networks.¹³ Nevertheless, the analytical focus on the coupling of interests and expectations does not explain why others should accept these promises, especially if they have no strategic interest in the technology in question.

Callon¹⁴ has touched on this question in his analysis of the debate and negotiations on electric vehicles in the 1960s and 1970s in France. The French electricity company EDF presented a comprehensive socio-technical scenario sketching a 'world' in which electric vehicles played a major role, a world devoid of the combustion engine. This socio-technical scenario was accepted by the car manufacturer Renault, even though it was not in accordance with Renault's interests. Only later, when some of EDF's predictions failed to materialise, Renault reversed their commitment and offered a competing scenario. Callon presents various methods by which actors try to make others comply with their scenario, ranging from pure violence, to seduction, to bargaining. However, more indirect social mechanisms, which do not depend on direct interactions between actors are missing from the analysis. Furthermore, it is not clear what caused the reversal of accepted socio-technical scenarios on either side. In a later section, possible expectation dynamics that may contribute to such reversals will be discussed.

The point here is that to understand the social dynamics of expectations and their role in technology dynamics, we have to consider not only which expectations certain actors hold and communicate, but also, how these actors refer to the specific expectations of others as well as to collective expectations.

Social Dynamics of Expectations: How Collective Expectations Guide Those Who Do Not Necessarily Share Them

Expectations guide innovation actors—e.g. designers, manufacturers, users, financial and political actors—in very different ways. Actors may hold specific expectations of the technical and economic potential of an innovation and engage in innovation activities on the basis that, if the expectation comes true, they will gain a specific benefit. This explains why actors with a rather clear interest in the innovation field participate in innovation activities. If expectations are broadly shared, actors are not only guided by their own expectations but also by the expectations of others, resulting in the mobilisation of more actors.

Expectations Turn into Taken-for-Granted Prerequisites of Action

For many actors, collective expectations gain the normative status of taken-for-granted self-evident assumptions that no longer have to be justified (as mentioned earlier). Indeed any challenge to the expectation would have to be justified. An expectation here becomes a quasi-certain prerequisite of action where alternatives need no longer be considered. First this is illustrated with an empirical example and then its implications are described in more detail.

In 2000, the e-commerce-hype was probably at its peak, illustrated in Germany by the high profile of the topic in two mainstream newspapers (see Figure 2). The attention paid to a specific topic in the mass media is not a general measure of expectation dynamics,

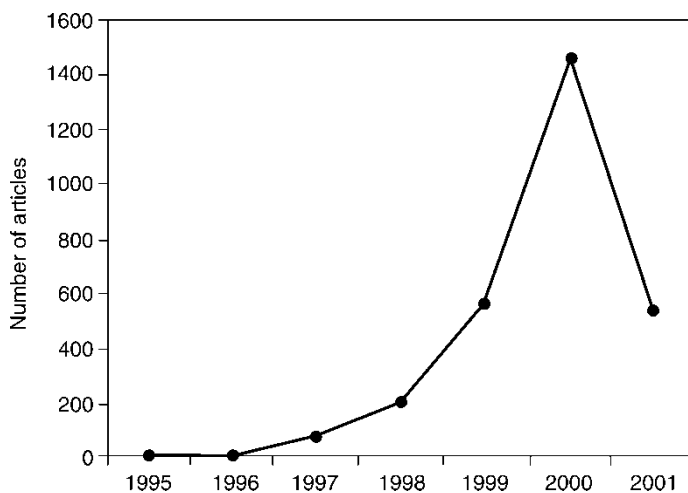


Figure 2. Number of articles mentioning ‘electronic commerce’ or ‘e-commerce’ as covered in two important German daily newspapers (*Frankfurter Allgemeine Zeitung* on CD-ROM and *Elektronisches Archiv Süddeutsche Zeitung*)

because the perception in the mass media follows specific rules of selection, which are not congruent to other societal domains and groups.¹⁵ However, it can serve as an indicator for collective expectations, if we can reasonably assume that the coupling between attention in mass media and the expectations in specific innovation fields, politics, etc., is high. Media attention is a particularly suitable indicator for widespread expectation dynamics as those relating to e-commerce.

During 2000 two case studies were conducted focussing on two firms that were developing software applications for business-to-business electronic marketplaces, as well as two firms that made use of these software applications. The case studies are based on qualitative interviews with eight employees of the firms, as well as publicly available documents. One of the users of the software applications was a German manufacturer of packaging machines participating in an electronic marketplace. In an interview, a representative of the firm with responsibility for e-commerce stated that to *not* participate in online transactions would be as if one 'wanted to abolish the car'. That is, he compared e-commerce with a highly established socio-technical structure even though e-commerce at that time had yet to become established in this particular sector. This came just a few months after an earlier interview in which the respondent had expressed quite the reverse and doubting whether online transactions held any future for the company.

The taken for granted extrapolation of established and familiar structures of the past is a well-known phenomenon.¹⁶ This type of expectation typically contributes to the reproduction of existing structures, when actors take them as an orientation for action. In the same way, actors may adapt to expected future conditions of action, even if these imply a radical break with existing structures. In this way they may ultimately contribute to the production of new structures. However, in this case, expectations are not taken for granted because of the experience of actors with established structures but because of the power of persuasion attributable to the collective expectations shared by many others.

Van Lente and Rip¹⁷ have introduced the concept of *prospective structures* created by expectations to denote 'a not-yet-existing structure that is to be filled in by agency'. This term describes quite well the function just presented, though in this paper it is used in a slightly different way—taking an action-oriented perspective and focusing on structure as perceived constraints of action. From this perspective, collective expectations are functionally equivalent to *perceived* established structures. However, they are clearly not of a structural nature, because they lack the inertia and stability of 'classical' structures, be they institutions or technical structures.

This function of collective expectations is rather ambivalent. On the one hand, it opens up new options and the potential to depart from established structures. On the other hand, expectations that are taken for granted lead to closure, because alternatives are eclipsed. If this happens, a new technology is to a certain extent relieved of the necessity to convince all actors of its concrete usefulness. This is most obvious, when actors are not natural supporters of a technology, but rather take a critical position as was the case in the example presented above.

Image Pressure

In a second way, collective expectations guide actors because they consciously take the expectations of others into account. These 'others' may be shareholders or customers, but they are not necessarily concrete persons who confront the actors in question with

concrete expectations or requirements. Rather they are generalised others to whom certain expectations are ascribed. Collective expectations can thus exert a social pressure to meet those expectations and invest in a new and promising technology—by developing, producing or using it—in order to demonstrate an image of being technologically competent. To explain this mechanism some examples will be drawn upon.

Following high rising expectations of multimedia technology in general, and interactive TV more specifically, German Telekom, the Ministry of Economic Affairs of Baden-Württemberg, one of the German federal states, and a couple of large hardware producers¹⁸ set up a large pilot project in 1994 that was supposed to test interactive TV in 4000 households. The case study is based on a series of twelve interviews conducted in 1996 with employees from Telekom, the industrial consortium and content providers, as well as on project documents and publicly available material.¹⁹

A popular science magazine wanted to participate in this project by providing content—popular science programmes—for a video-on-demand service. The chief editor of the magazine stated that an important motivation to take part in the pilot project was to maintain an image of being technologically competent.

We consider the magazine as an institution that is [located] at the interface between science and the public. [We participated] to strengthen the reputation, the image, as an institution which has this transfer competence. If such a possibility opens up right in front of us and on the basis of media we are already using, that is videos, one should take part in it. Especially since we claim to be competent in new technologies, therefore we are also competent to use new technologies. And by that we demonstrate it. . . . participating is of course an image gain for our magazine. (Chief editor of a popular science magazine, 11/1996)

However, personally the chief editor was far from convinced that the technical system, which was to be tested in the pilot project, and the pilot project itself, were promising. That is, referring to his *personal* expectations, participation in the pilot project would *not* have been a sign of technical competence. Rather, he referred to the ascribed expectations of generalised others.

Another example can be found in the case of e-commerce. One of the above-mentioned developers of e-marketplace software was developing a software module enabling auctions to be held on the e-marketplaces. While the head of the development department showed a firm conviction concerning the overall potential of e-marketplaces, he himself did not hold *auctions* to be a particularly promising feature of e-marketplaces in the business-to-business environment in the near future.

Apart from the fact that they are part of it [our portfolio] and we hold them to be an interesting feature, our surveys showed that auctions are something which does not work very well online. It makes no profit. It's a business model which will take some more time (Head of Development, software company B, 10/2000).

Nevertheless, auctions were high on the agenda for electronic marketplaces in 2000. Customers or shareholders would doubt the overall competence of an actor who did not support the latest technology that was considered promising by many or a feature that

had become a self-evident part in the ideal image of a new technology. Consequently, there was a strong pressure for the actors to measure up to these new trends.

Because of the qualitative character of this data it remains unclear to what extent these examples are general features of a wider situation. In a representative survey among 1300 German companies in 2000,²⁰ 54% of all participating companies, which already had a website or planned to set up a website in the following year, stated that they would have to offer e-commerce for competitive reasons, even if this would not generate any relevant turnover. The target that was most frequently achieved was an improvement of the company image. Finally, only a quarter of the companies operating a website had developed an explicit Internet strategy. Therefore, we may assume that a large number of the companies engaged in e-commerce activities not so much because they had identified a specific benefit for their business, but rather because they were following collective expectations.

These results strongly suggest that the mechanisms just described play a central role in expectation dynamics. Though we may not expect actors without a primary interest in an innovation field to be highly active in discourse activities, they still contribute to expectation dynamics through their participation in innovation activities, whatever their *specific* expectations may be.

Interpretative Flexibility of Project Results

According to a common model of expectation dynamics—the famous hype cycle of the Gartner Group²¹—expectations can be seen to rise rapidly to highly inflated levels. Such peaks are then seen to collapse when reality, e.g. in terms of project results, fails to live up to such high expectations. That is, project results deliver the ‘hard facts’ against which expectations are measured. However, the interaction between expectation dynamics and project results, is much more complex than this model implies. The results of technological projects are interpreted in the light of the same expectations they are supposed to ‘validate’. This is because ‘hard facts’, or evaluation criteria, are themselves subject to interpretative flexibility.

So-called ‘hard facts’ that may serve to evaluate a project and to validate its underlying expectations may include things like the number of users, the stated interest of users in the technology or service, the feasibility of a technology or service and economic results as turnover or profit generated by a new technology or service. However, often there remains substantial uncertainty as to what the outcome of either individual projects or the sum of projects in an innovation field will be.

The first reason for this is because it is not always possible to judge whether expectations have been met or were a source of deception. Expectations of the potential turnover that could be generated by the development and the application of e-commerce were an important ingredient of the e-commerce hype. Nevertheless, during 2000 it was not possible to create reliable aggregated data on what had been the actual turnover created by e-commerce.²²

At the micro level of various projects, it was found that these kinds of performance results were unavailable to the project team. This applies to the number of users, user acceptance, turnover and profit generated by a technology or service or system performance.²³ It is even hypothesised that the central and crucial expectations of a project are typically the last to be ascertained—because they are rather taken for granted and not

called into question. Furthermore, it is often not clear what should count as success or failure. How many users can reasonably be expected? What levels of 'user satisfaction' are enough? How reliable must a new technology be?

Moreover, it is often a matter of interpretation what conclusions should be drawn from the results of a concrete project for user acceptance, feasibility or economic value of a technology in general—even more so, for *future* user acceptance, feasibility or economic value. More usually, problems arise when a new technology or service is implemented. These problems could be interpreted as the project being technologically impracticable and it could be concluded that users simply do not accept the technology or service in question or that it is of no economic value for the company. Often it can also be argued that problems are a result of specific circumstances of the project, which will change in the near future or in further projects, and therefore the technology or service as such is not called into question. The interpretative flexibility of project results will be illustrated by looking at the interpretation of the outcome of a number of interactive TV projects.

The concept of interactive television reaches back to the 1960s. At that time the potential of interactive cable networks was discussed in connection with the vision of a 'wired nation'. Essentially, the same scenarios of use were discussed 30 years later, e.g. video-on-demand, teleshopping or information services.²⁴ In the 1970s and 1980s experiments were conducted in several countries, which in some cases lasted over a couple of years,²⁵ though by the mid 1980s most of these projects had been cancelled.²⁶

In 1991, Time Warner started a new project on interactive television in New York. This provided a near-video-on-demand service, that is, the same programme was transmitted over different channels in intervals of 15 or 30 minutes. The back channel was used to transmit the data necessary for charged programmes. Time Warner made no comments concerning the profitability of the service, but the stated number of users was below the limit considered necessary for a profitable service at the time.²⁷ Two years previously, GTE, a US-telephone company, started a pilot service based on cable and telephone networks called 'Main Street' including teleshopping, video games, banking and information services. In addition, they offered a near-video-on-demand-service. While the near-video-on-demand-service was taken on by more than half of the cable customers, four years later only a small number of customers had subscribed to the 'Main Street' service. Nevertheless other cable companies would later also offer 'Main Street' to their customers.²⁸

In 1993, Time Warner announced an ambitious project, the Full Service Network, which was the starting point for a spiral of expectations and a wave of project announcements on interactive television. Given that similar projects regarding use had earlier given moderate results it is important to ask why enthusiasm remained so high. Considering some of the previously mentioned application scenarios (video on demand, teleshopping, etc.), each of which had been the focus of relatively unsuccessful projects, a systematic critique of such 'notoriously unsuccessful travelling myths' has been called for.²⁹ However, because of interpretative flexibility, problematic results of former projects do not provide an irrefutable argument against application scenarios. This can be shown by looking at the assessments of what had been achieved by central actors of interactive TV.

If the interest of users was rather moderate it may be the case that the target group may not have been chosen appropriately. A representative of GTE Main Street referring to the small interest in movies by customers remarked that the 350 users were mainly upper-middle-class Asians, who were interested principally in educational and sports

programmes.³⁰ Perhaps a higher user-friendliness would lead to better results? The president of Time Warner's New York City Cable Group remarked:

We learned, you need a really good navigator system, where people feel they have a personal navigator to help them. We didn't have enough of that in Queens. It wasn't friendly enough.³¹

Moreover, what is the right yardstick to assess the interest of users? In the follow-up-projects of the 'Main Street' service—compared to the first trial—significantly higher numbers of users were reported. However, the president of one of the cable companies which offered the service complained that only a fifth or fourth of their customers were interested in interactive services.³² Are services of one project comparable to those of others? Or does it simply take more time until users change their behaviour? When the projects took off rather slowly in 1994, a manager of GTE Main Street argued:

To really embrace this, people have to change their behaviour. That usually takes a long time. It's just like ATM [automatic teller machines], which were widely held to be a failure in mid-70s.³³

In addition, results concerning practical feasibility are difficult to transfer, if follow-up projects are supposed to implement other technologies. Particularly, results concerning profitability are hardly transferable and reliable economic calculations are rarely possible. If calculations are possible they rely themselves on expectations and assumptions which can easily be called into question:

'If we can do four to five dollars in additional cash flow per month for twelve months,' says Comcast president Brian Roberts, 'we can almost completely pay for rebuilding our entire cable system with fibre. That's fifty dollars a year, and if we borrow at the normal ten times cash flow, that's five hundred dollars per customer to spend. If you have one hundred thousand subscribers, that's fifty million dollars, or what it costs to rebuild a fibre system.'

Joe Collins of Time Warner challenges Roberts's assumptions. How does a business calculate how much incremental revenue it needs to earn a profit, he asks, when it does not yet know its incremental costs? Until it knows its costs, how can it price? And it can't know costs or prices until it knows viewers preferences.³⁴

Social Dynamics of Expectations: Suspension of Evaluation Criteria and the Interaction of Collective Expectations and Innovation Projects

As these examples show, collective expectations strongly influence how project results are interpreted. As long as the collective expectations are high and function as a prerequisite of action (as mentioned earlier), they provide a protected space. Project outcomes will be interpreted rather favourably or evaluation criteria may even be suspended, i.e. criteria will not be ascertained or, if so and if the outcome is negative, they are still peripheral to decision making. Yet, if collective expectations and the protected space collapse,

evaluation criteria are often reactivated. This reactivation leads to a sudden reinterpretation of project results without such results necessarily having changed very much.

Now the interaction of a protected space created by collective expectations and the specific expectations on the local level of a project will be analysed. For this it will be focussed at the end of the pilot project on interactive TV presented earlier and at the e-commerce-project of a large German department store.

The pilot interactive TV project had started with high ambitions, yet in due course various problems arose, e.g. in the set-up of the project and the innovation network, in the project management, technical problems and changes in the political, technological and economic environment of the project.³⁵ These difficulties led to repeated postponements of the start of the operating phase, but the project itself was not cancelled. In 1996, technical problems occurred in the final tests before the first users were to be connected, and only then was the project cancelled. In its official announcement, Deutsche Telekom referred to these technical problems, though this explanation was contested in public discussions following the announcement. Telekom and the Ministry of Economic Affairs were said to have lost interest in interactive TV. They had taken the technical problems as a welcome pretext for closing the project.

It is likely that these explanations are not necessarily mutually exclusive but, rather, complementary. In 1996, collective expectations concerning multimedia, which had been the major motivation to initiate the project in 1994, had been modified substantially. Multimedia still held promise, but interactive TV was no longer seen as a promising variant of multimedia (see Figure 3).³⁶ Expectations had instead migrated to the Internet (see Figure 4), a development that had not been foreseen by the major actors of the project, Deutsche Telekom and the Ministry of Economic Affairs. This shift in collective expectations led to a loss of the protected space for the pilot project. As long as the protected space existed, problematic situations had been interpreted as something that would be overcome. It could hardly be decided definitely, if the technical problems encountered in the system test meant that the system simply did not work or if the technical problems were simply to be solved. That is, if what had been achieved so far was a 'solid basis' for

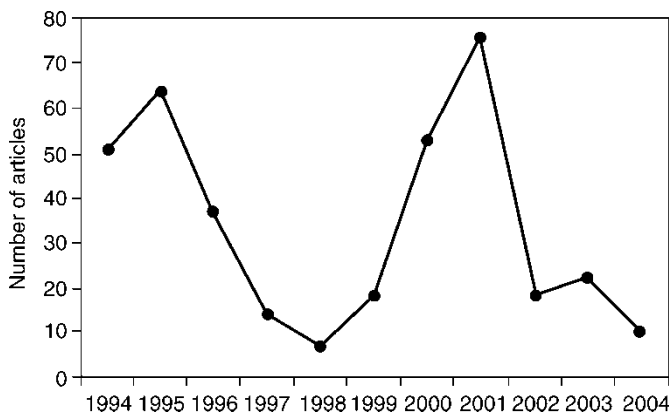


Figure 3. Number of articles mentioning 'interactive television' as covered in two important German daily newspapers (*Frankfurter Allgemeine Zeitung* on CD-ROM and *Elektronisches Archiv Süddeutsche Zeitung*)

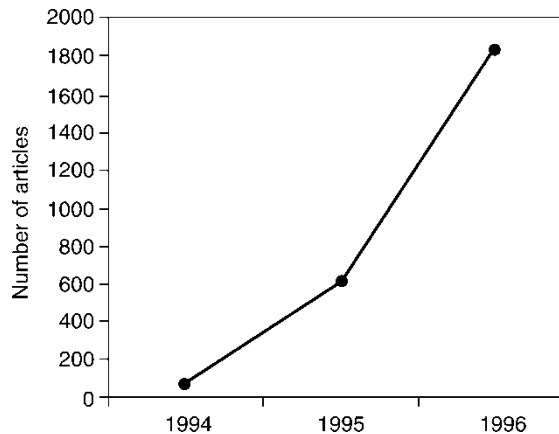


Figure 4. Number of articles mentioning the 'Internet' as covered in two important German daily newspapers (*Frankfurter Allgemeine Zeitung* on CD-ROM and *Elektronisches Archiv Süddeutsche Zeitung*)

the continuation of the development of 'one of the most efficient and promising technologies for interactive television', as Alcatel-SEL that was responsible for the technical system presented it, could hardly be decided definitely. Yet, after the protected space was lost, the interpretation turned out negatively, whereas before similar problems had only led to postponements.

The suspension of evaluation criteria in the protected space and the reactivation of the suspended facts once the protected space collapses is even more obvious in the following example. In 1996, a large German department store set up an Internet store, which was supposed to generate relevant turnover. However, three years later turnover remained rather small. The number of visitors was substantial, but only 2% actually made an order. The investment budget was stated to be DM 65 million for a period of four years compared to the DM 6 million turnover in 1998 (before it had been even less). Nevertheless, a representative of the department store, who published these figures in 2000, stated that profitability was not an adequate criterion during the investment phase—that is, this criterion had been suspended.

What can't be measured in terms of money is the know-how of the staff, which has intensified continually. In the investment phase profit is out of question. Therefore it is no direct measure of success.³⁷

He underpinned his interpretation by referring to collective expectations of e-commerce, referring to forecasts and statements of experts that predicted a highly promising future for online-shopping that would be exploited by those who invested early enough.

However, only a short time later the Internet store was closed and reopened in 2001 following a completely different concept: it was now considered just another marketing instrument with *sales* over the Internet playing only a marginal role. The current head of new media activities now explained the new concept by referring to the low turnover.³⁸

What had happened in the intervening time to cause such a profound reinterpretation and rather sudden reactivation of criteria? In the second half of 2000, the spiral of collective expectations on e-commerce collapsed following the breakdown of the 'new economy' stock market, and therefore also the protected space these expectations had created ceased to exist. In particular, consumer-oriented e-commerce was no longer considered to be as highly promising. More generally, the reactivation of evaluation criteria leads to a sudden leap, a discontinuity in the evaluation of a project. As long as the protected space is maintained, certain criteria are not considered at all or at least are not rated very highly. Hence, the balance of promising expectations and less promising results remains positive; without the protected space, however, the balance topples over and negative evaluations prevail.

Wheale and Amin³⁹ conducted a quantitative study which demonstrates the broader relevance of the mechanisms described above. They showed that evaluation criteria applied by investors for companies offering and enabling e-commerce differed substantially before and after the collapse of the stock market in 2000. Before the collapse, stock market prices of Internet companies only partly correlated with six of the most prominent measures of corporate performance. Particularly, measures evaluating the company's efficiency in earning profits in terms of the capital provided by its owners did not correlate. After the breakdown of the stock market, all measures correlated with stock prices.

Now we have seen how collective expectations influence the interpretation of project results. In addition, expectations and experiences in specific projects interact with collective expectations. As will be shown in the following example, this interaction may explain the dynamics happening at the 'turning point' of hype-disappointment cycles. The project level and the level of collective expectations are strongly coupled in an innovation field like interactive TV, which was dominated by a limited number of actors as huge telecommunications, IT or media companies and also by a limited number of rather large projects. The e-commerce field was structured differently. Only a few actors and projects were of high visibility and it was characterised by a multitude of comparably small projects that each had only limited, if any, effect on the collective expectations. Expectation dynamics of e-commerce were coupled to dynamics in the stock market which were themselves partly determined by expectations of the potential of e-commerce, but they were also following an independent speculation dynamic.

The expectation spiral of interactive TV took off 1993 when Time Warner, the world's largest media group, announced its Full Service Network. This project, accompanied by large amounts of rhetoric on the imminent revolution of television, served as an indicator for a promising field. Further actors were attracted into the field and a wave of project announcements followed. Each project strengthened the collective expectations, which motivated further projects, which again strengthened collective expectations, etc. However, once collective expectations are weakened, either because of negative experiences at the project level, which can no longer be compensated by collective expectations, or because of shifting expectations, an inverse dynamic is triggered. In the case of interactive TV both these scenarios occurred. For example, the Full Service Network faced substantial problems, leading to postponements of the project and expectations shifted to the Internet.

As a result of reduced collective expectations, certain projects lost the necessary protected space and were subsequently cancelled. This exerted negative feedback on

the collective expectations, further projects lost the protected space and were cancelled, which again weakened collective expectations, etc.

The expectation cycle of interactive 1990s TV was not only preceded by former expectation cycles, but also followed by another cycle (see also Figure 3). Around 2000, expectations around interactive TV started to rise again. Time Warner in the USA and Bertelsmann in Germany started new projects regarding video-on-demand and well-known consultant companies as Forrester or Jupiter forecasted a fast market growth until 2006, which would bring interactive TV, specifically video-on-demand to 25–40% of the households in the USA and some European countries.⁴⁰

Conclusion

This article has approached the dynamics of expectations from a micro perspective, focusing on actors and technological projects as central interfaces and sites where expectation dynamics and technology dynamics are linked. This approach has allowed a contribution to an understanding of how precisely expectation dynamics affect innovation processes.

A theoretical conception of expectations has been presented, which has proved particularly well suited to highlight the specific character of collective expectations as a *fait social*. Based on this, three forms of collective expectations and the way they affect innovation projects have been presented. First, I analysed two ways by which collective expectations motivate innovation actors to engage in innovation projects: collective expectations become a taken-for-granted prerequisite of action and they exert 'image pressure'. These mechanisms have been shown to play an important role in expectation dynamics, because they are able to motivate large numbers of actors—even if these actors may *a priori* hold only a marginal interest in the innovation field. This is not only important to understanding hype dynamics, but also to how expectations contribute to the introduction of technologies into society. For this, a large set of heterogeneous actors has to be motivated and co-ordinated.

Furthermore, it has been shown how collective expectations influence the interpretation of project results. As long as collective expectations create taken-for-granted prerequisites of action, these function as a protected space. Then a dynamic perspective was added, which allowed the description of the dynamics at the 'turning point' of hype-disappointment cycles as a result of the interaction between specific expectations and collective expectations. As could only be touched on, these dynamics interrelate further with more general technology dynamics. As illustrated by the case studies, collective expectations interrelate with project results, but at the same time they interrelate with expectation dynamics on competing technologies (Internet) or with the dynamics of financial markets (e-commerce). Furthermore they interrelate with technology dynamics at the level of sectors.⁴¹

The empirical case studies showed also, that a variety of dynamic patterns seem possible. The expectations of e-commerce around 2000 may be considered as a typical example of a hype-disappointment cycle followed by a phase in which innovation activities in the field continued, although on a more modest level. This model has been propagated as a more or less universal model by the Gartner Group and has recently received considerable attention. The long-term fluctuation of expectations of interactive television, however, does not fit this model. Therefore, a systematic analysis of different

patterns of dynamics, taking into account different frame conditions, e.g. the structure of actors in the field, constitutes a promising topic for further research.

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