

Time and Innovation - Micro-sociological aspects of technological entrepreneurship

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Abstract

This paper explores the process of small-scale technological innovation through the concept of experienced and enacted time. By conducting a series of semi-structured interviews with entrepreneurial innovators around issues of time and their ventures, we were able to construct four higher-order concepts: time as a force, as a flow, as relations and as time as a personal, cognitive resource; as well as 12 sub-categories depicting ways in which time and innovation is weaved together. The study concludes with a number of suggestions as to how previous research on innovation may be extended in the light of the present findings. Especially important in this respect is the call for a stronger emphasis in innovation research on intentionality, uncertainty creation, vision and social action as being significant denominators of this phenomenon.

Keywords: Technological ventures, time, innovation, entrepreneurship, action

Introduction

An independent technological venture (ITV) is a process of technological innovation which takes place outside of a larger company context and which is driven by one or more entrepreneurial innovators¹, not seldom spun out of academe. While this form of technology based innovation *qua* business activity receives more and more attention in the innovation literature, the present paper aims at investigating a fundamental existential aspect of innovation, i.e. how time is perceived, enacted and used, through the window of this phenomenon. Time has been said to be a basic experiential dimension of all human action (McGrath, 1988). Hence it is likely that the closer one looks at the act of innovation in the sense of pro-active reconfiguration and contestation of the present in order to increase value in the future, the more important the dimension of time will become for understanding innovative behaviour. Future orientation or vision of future is of the essence for innovation to take place (Nightingale, 1998), and formal and informal time management is often used pro-actively in entrepreneurial activity to gain advantage (Kuratko, 1995).

The activity of independent technological venturing has been seen as a reflexive shaping of the world from the individual's point of view, where the small firm is used as a vehicle for techno-economic adaptation and realization of vision. In this conception, innovation and venturing alike are "practices of knowing and doing, of anticipating and acting", and it is exactly here that time in the sense of foresight and future orientation becomes clear (Fuller, 2000). Simply stated, all human action is directed at some perceived possible future, and to the extent that the innovative venture could be said to carry any particular facilitating qualities or be said to be doing anything special it would have to have a strong bearing on the temporal dimension.

There are many conceivable benefits in understanding how the innovator relates to time, how the venture is immersed in a time dimension, where specifically time may be used as a strategic resource. For one, it may give us some insight into the general psychology of how a vision is managed in innovative activities. In this sense it may facilitate a deeper understanding of the innovation process itself, albeit a process which is dependent for its meaning on the particular context of innovation and its location between technological and business development. We would probably also benefit from a deeper understanding of how time and concomitant outlook on future comes about as an integral aspect of venturing strategy. The prescriptive literature in

this field is ubiquitous (e.g. Arnaldo & Majluf, 1996), and could take advantage from descriptive concepts of venturing strategy drawn from a study of the behavioural/existential foundations of the phenomenon. Part of the aim of this paper is to propose, tentatively, such concepts.

In order to achieve this, the paper is structured so that after this introduction, a deepened theoretical review of some of the elements of this problem is taken up, such as it has been touched upon in the academic literature. This section forms the background against which will follow a short section on method and a presentation of the results of an interview study with key persons in number of technology based start-up companies. The results of this interview study will then be synthesized in a discussion section, and theoretical and practical conclusions will be drawn.

Elements of the problem

Independent technological venturing (ITV)

Technological venturing that takes place inside of the company, so called corporate venturing has been shown to differ in significant respects from ITV. For the venturing individual, ITV usually encompass a longer coherent process of transforming a scientific discovery into an innovative product or process that meets customer needs, where in the corporate venture this process is more likely broken down into semi-independent, organizationally distributed segments (Zahra & George, 2000). In particular, the persons involved in the ITV must themselves develop market share, manufacturing capabilities and strategies to ensure sustained survival as part of the local innovation process (Marino & DeNoble, 1997; Pisano & Wheelwright, 1995). Since the ITV cannot draw upon the large resources of the established firm in strategizing their ventures, they must depend on personal ability, adaptation and innovative performance.

At the same time as the independent venture is usually more constrained with respect to finances and has to obtain capital from owners and venture capitalists, these ventures benefit from the direct and active involvement of their owners (Shrader & Simon, 1997). In addition, the owner's incentives are closely aligned with the success of the firm. These characteristics make the ITV a window into basic cognitive and social processes of innovation quite unlike that of the corporate venture where tight administrative control and planned achievements of salaried managers are more often

determinants of process (McDougall et al., 1992). For our purposes, these more basic processes of innovation requires additional attention.

The cognitive and social process of innovation

The concept of innovation has been suggested to encompass a complex activity which proceeds from the conceptualization of a new idea to a solution of the problem to the actual utilization of economic value (Meyers & Marquis, 1969). The process of innovation may also contain the innovative artefact as a necessary (but not sufficient) sub-component, and as such be said to be any idea, practice or material artefact perceived to be new by the relevant unit of adoption (Zaltman et al., 1973).

Hence the most general conceptualization of innovation puts forward as central:

- Novelty, by which something which did not exist before is brought into existence.
- Intentionality, by which this particular new idea, practice or artefact is created and modified by an agent for the purpose of creating value.
- A process of change, by which the process of conceptualizing the idea towards realizing the product and finally letting that product reach a unit of adoption is processual in that it replicates a chain of events.

It is easy to see how all three of these characteristics imply a dimension of time, e.g. priority in the sense of a “before and after”, foresight and projection of possibilities, and action towards possible futures.

In the same spirit, Nightingale (1998) has argued that unlike scientific knowledge production, which moves from known facts and models towards an unknown future, innovation describes the opposite in that it starts with unknown conditions and works its way towards a desired end result. Central to the process of innovation then becomes the search for those unknown starting conditions that will achieve the end. The particular mechanisms of envisioning these desired ends and inferring necessary starting conditions must to some extent be dependent on how the innovator interprets the present on the basis of related past experiences or memories. In this sense, when the future trajectory towards a desired goal is projected this is done in the context of what may be referred to as a ‘remembered present’. From a cognitive perspective, the individual dimension of the process of innovation may simply be to act on patterns in one’s experience, properly recognise how these patterns relate to the situation at hand and the desired goal (Turro, 1986), and then extrapolate from these a possible future of worth. This process could also be described as “the purposive

adaption of means to reach a preconceived end” (Layton, 1974, p. 696), or somewhat more poetically a movement “from the given to the possible” (Nightingale, 1998, p. 697).

The social process of innovation seems to mirror some of these cognitive characteristics. For example, Lowe (1995) emphasises how uncertainty and ambiguity in the social setting as to resources and markets easily becomes a strategic resources which the innovator tend to exploit. The praxis of such exploitation involves the overcoming of obstacles in the social world, e.g. threats to the organization and to the vision. Thus, on a social level innovation proceeds through a manipulation of social/environmental constraints to realize a goal (Stansworth & Curran, 1973). The specific process of transforming obstacles into “innovative energy” in order to realize the goal may be fertile grounds for researching the connection between the cognitive and the social in innovation. The impermanence of conditions often surrounding truly innovative ventures may also require a “reflexive” attitude on the part of the innovator (Chell et al., 1991). This is to say an ability not only to work in the context of social turbulence and uncertainty, but also to reflexively adapt within the constraints of the vision and own (group) abilities. Such adaptation could possibly require a hyper-reflexivity as to the different “possible selves” (Markus & Nurius, 1986) of the individual and his/her ideas, and how these bring to bear on the changing conditions of the venture (e.g. the starting conditions above). We will now look closer at how time as a basic phenomenon may elucidate some of these aspects even more.

The constitutive nature of time

Jones (1990) has noted that different cultures approach time in different ways. Spring boarding on this insight, authors have described the dominant conception of time in the Western culture as modified Newtonian i.e. where time is a structured succession (divisible and homogenous), linear (uniform and unidirectional), abstract (disconnected from action and events), absolute (always the same) and independently measurable (e.g. McGrath, 1988). This linear-quantitative concept of time (Hassard, 1989) finds its foremost notable representation in *clock time*; a dominant modernistic trope which is fundamentally intertwined with the development of industrial society (Clark, 1985). In management, time is naturally related to productivity, e.g. where efficiency is often evaluated against the period of time it takes to accomplish a given amount of work (Bluedorn & Denhardt, 1988). Time as resource also presents the

problem of allocation and a challenge that has been argued to be the main source of competitive advantage today (Hassard, 1991; Stalk & Hout, 1990). Quantifiability is inherent in the concept of time *qua* economic resource.

This concept of time has dominated most research in management and organization studies (Lee & Liebenau, 1999), however, it is but one in a wide range of conceptions currently on the research agenda. Clark (1985) has argued that a sociologically grounded analysis of time related events requires a theory of time which recognizes time as socially constructed, that is a concept of *social time*. He emphasizes that modern organizations rely on action based time as well as on more abstract clock-based systems. According to Clark, time is *in* the enacted event, i.e. events which are defined, created and acted upon by organizational members. Akin to this concept is that of organizational time, which provides the means for synchronizing and coordinating the activities of groups. Gherardi and Strati (1988) regard organizational time as being comprised of a plurality of times, which concretely may involve the planning of activities, but which on a higher level of abstraction takes the form of an imaginative predictive creation of the future context towards which an action is directed.

Lawrence and Lorsch (1967) proposed that the time orientation of organizational members play a significant part in departmental differentiation and integration. For example, the members of production and sales departments who got rapid feedback from the market tended to have shorter time orientations (shorter time horizon) which could be shared across the organization. In contrast, researchers in the R&D department who received the final feedback of the success or failure of their projects only long after these had ended, tended to integrate poorly with such departments who received short-term feedback, e.g. marketing and sales (Ebert & Piehl, 1973; Lee & Liebenau, 1999). This insight bears well on the received wisdom concerning innovators, where the independent innovator bridges the traditional roles of technical development and market. However it is unclear from the literature if one time perspective tends to dominate in such situations. In fact Hofstede (1993) elaborated this divide in time orientation on the level of cultural analysis by adding a dimension of long-term vs. short-term orientation which he found to be basic to work-related attitudes in different cultures.

An understanding of time that somewhat bridges this division may be found in the cyclical time concept. The process of repetition recognized in for instance work on

the product life cycle (PLC) is important to our understanding of time. Especially the idea of “cyclical time”, where past, present and future turn in a circle (Gurvitch, 1964) is a generally accepted concept in the marketing literature, exemplified by the business cycle of development-production-sale (Kotler, 1991; Davies, 1994). Fashion cycles, environmental cycles, (e.g. seasonality) and consumers’ behaviors, such as the replacement cycle in product sales, offer other examples. On the individual level, people will respond differently to marketing stimuli depending on their position in a number of cycles, such as biorythms and the life cycle, or to events within such cycles (Johnson et al., 1991). Returning again to the innovator in ITV situations, it may be noted that the product and the market are often at different stages in a number of cycles.

Finally, we may note that competitive environments that are turbulent and unpredictable put demands on the *timing responses* of individuals and groups (Bartlett & Ghoshal, 1991). Good timing is an oft cited resource in entrepreneurial ventures, and is central to the entrepreneur’s and the innovator’s self-perception (Bidhé, 2000). In established structures, compliance with schedules and deadlines, punctuality, and awareness of time use is crucial to firm survival (Benabou, 1999). At the individual level of analysis, phenomena such as time urgency and individuals’ perceptions of deadlines have been investigated (Landy et al., 1991). Time urgency has been linked to individual-level outcomes and Type-A behavior (Conte et al., 1995). The time urgency literature suggests that time-urgent individuals are more concerned with time, timing and deadlines. In the ITV, the individuals’ voicing of these concerns and their attention to time may act as a catalyst or pacing mechanism for subsequent group behaviors (Waller et al., 1999). If venturing is foremostly perceived as a group activity rather than an individual one, these processes become important, since such a catalytic time urgent individual may encourage higher levels of simultaneous task performance on the group level, i.e. group polychronicity (Conte et al., 1995).

Method

Participants

The sample was purposive and consisted of 10 entrepreneurial innovators who had been working in technology based entrepreneurial ventures for at least one year, or until such a time when the venture had started to stabilize. Common for all the

participants was that they had both been full or partial inventors of the technology around which the venture was developed, as well as having been instrumental in the commercialization of the innovation. The participants had been developing their innovations within a range of fields and were fairly well distributed between biotechnology, pharmaceuticals, information technology (hardware, software and services), and medical technologies.

Procedure

The participants were interviewed in their companies for 1,5-2 hours by 2-4 interviewers at a time. The interviews were semi-structured and questions concerned general aspects of the innovative venture, with a special emphasis on critical enablers and threats to the venture from a temporal perspective. Following Lofland and Lofland (1984) the interviews were documented in detail through note taking, with a particular attention to key quotations with a bearing on temporal aspects. These notes were then compared between the interviewers and transcribed into protocols.

Analysis

All the protocols were read by all the interviewers for threads of common meaning, both as to background data and narrative as well as with respect to quotations made by the participants. An agreement on content was thence established. The individual protocols were then re-read and analyzed line by line and broken down into discrete parts, not with respect to syntactic rules but rather where *meaning units*, i.e. a 'visible change of meaning' could be identified (Giorgi, 1985). Emerging themes were written in the margin using codes, which captured the essential quality of what was said by the participant. The themes and their interrelationships were focused on in more detail and similar themes were clustered into categories. These categories were further abstracted into a few higher-order factors, representing master or higher-order concepts (Miles & Huberman, 1994). The factors were finally used to generate a conceptual model describing the hypothesized interrelationship between the factors and their internal dynamic.

Results

The result of the interviews includes 12 categories subsumed under 4 higher-order concepts which depicts how time and innovation connects in independent technological venturing.

Table 1: Time and innovation, higher-order concepts and categories.

| HIGHER-ORDER CONCEPTS | CATEGORIES |
|---|--|
| <p>The force of time</p> <p>Time is “real” in the sense that it exerts an independent force and has an impact on the innovation</p> | <p><i>The future in the past</i></p> <p><i>The future in the present</i></p> <p><i>Time reification</i></p> |
| <p>The flow of time</p> <p>The innovation is driven forward by the unfolding of events and is acted upon by the innovator in continuous time</p> | <p><i>Time strategy and learning</i></p> <p><i>Tempo and pace</i></p> <p><i>The internal time dimension of the innovation</i></p> |
| <p>Relational time</p> <p>The meaning of the innovation is dependent on external actors and negotiated with respect to time</p> | <p><i>Time and social dependence</i></p> <p><i>Time negotiation</i></p> |
| <p>Innovator’s time</p> <p>The innovator envisions goals, reduces uncertainty and develops a sense of faith through a perspective on time.</p> | <p><i>Time and self-constitution</i></p> <p><i>Envisioned futures</i></p> <p><i>Time and uncertainty</i></p> <p><i>Outlook and faith</i></p> |

In what follows these higher-order concepts and categories will be presented. All the citations are chosen as representative for the particular category.

The force of time

The future in the past

This category depicts the innovator’s perception of how the future is inscribed or affected by what has happened in the past. This is not the same as to acknowledge the trivial necessity that future always flowing from the past. Rather it has fundamental implications for how the innovator conceptualizes continuity, cause and effect in the venture. For instance, earlier choices *vis a vis* competitors may be seen to have an impact on how the innovator can behave in the future, e.g. “*While developing this product we have thought two steps further than the competitors. The reason for this is*

that they did not run with a technological perspective from the beginning, but applied a business perspective in the early phases". It may also be possible for the innovators to reconceptualize past choices, which did not seem favourable at the time, in the light of potential future benefits, e.g. *"They sold themselves cheap to S, but maybe at that point they created what was really important for success; namely publicity and customer recognition"*. The future may also be dependent on the past in the very practical sense of the innovator having to make considered sacrifices in order to continue with the innovation, e.g. *"D required ownership in the company if M was to get access to their substance"*.

The future in the present

This category is related to how the innovator perceives the future significance of what he/she is doing at the moment. The views expressed here pertain to the awareness of the present as a stepping stone, and to the restrictions it imposes on what can be done. This may have to do both with how current technical activities are assumed to resonate in the future, e.g. *"To fine tune the production equipment takes time and causes delays which in turn hampers future expansion"*, but it may also pertain seeing one's current activity as a way of causing positive or well considered outcomes in the future, e.g. *"P sees G [the company] as a test case for determining if and how one can spin out this type of technology"*.

Time reification

Time reification is a general category which pertains to the tendency of the innovator to consider time as a thing in and of itself. That is where time is a hard factor which can be 'put on the table', e.g. *"Time, market and customers are the main factors in the venture capitalist presentations"*. Or where time is seen as specific, concrete units which are necessary passage points for the innovation to continue, e.g. *"...one risk [to the venture] is not to get into the time slot"*.

The flow of time

Time strategy and learning

This category has to do with those aspects of the venture where the innovator acts in a flow of events (or a chain of events) which are partly stimulated by him/herself, and thereby develops knowledge of how things unfold in time. In many ways this behavior

can be seen both as a strategy in its own right, as well as a learning process which proceeds by tinkering with events and goals. Consider the following quotes: *“One has to try, to feel one’s way, and to proceed incrementally. The business is a chain where the links constantly break, and as they do, one has to get there and fix them.”* And also the statement: *“...it’s about acting and testing. That’s the way you learn about the system [where the venture is located].”* One innovator emphasized the connection between time strategy and innovation in a profound manner: *“I often think [of the innovation] in terms of ‘as if’ and about consequences in terms of ‘what if’”*.

Tempo and pace

This category relates to the tempo and pace of the innovative venture. Both in the sense of innovators having to speed up the process in order to be successful, e.g. *“In the Internet era, one cannot wait - one has got to act fast”*, as well as in the sense of strategically slow it down when needed, e.g. *“It’s OK to wait for robustness. That way other more significant actors may want to come along and try out the concept”*. The ability to increase tempo and pace may result from certain actions being taken, e.g. *“... by doing that we can go out faster and broader in order to get funding. We can run the process much quicker”*. By ‘running fast’ an innovator may create independence and a sense of autonomy, as is evident in the quote *“You have to develop a critical mass internally, that is not through consultants, and in that way increase the tempo. This gives you control of the process.”* But pace and tempo can also have adverse effects on the venture in the sense that the innovator may develop a kind of tunnel vision, e.g. *“The tempo and the quick decisions have repercussions on strategic behavior. One employs the wrong people or fails to evaluate alternatives correctly.”*

The internal time dimension of the innovation

In many ways the product or the venture seems to have a time dimension of its own that exerts influence on the innovator’s degrees of freedom. This internal time dimension may be fairly trivial, e.g. *“...to develop an application for boats means you’re in a seasonal market”*, or when *“a big threat to this particular innovation is that the technology diffuses too slow”*. The innovation ‘Eigentime’ may lead to the venture flexibility or rigidity depending on the characteristic pace of the product. One may also conceive of this time dimension in terms of adaptive flexibility, e.g. when *“the idea is general enough to be adapted to new applications should the first one fail*

for some reason". The innovation may also embody a certain something that in itself seems peculiar to the times, e.g. *"We believe the model to be a 'sign of the times'"*.

Relational time

Time and social dependence

Time is also a significant factor in terms of how it acts constitutively in the social relations and interdependencies that an innovator develops in the course of the venture. For instance, when time is wasted this may impact directly in terms of competitor advantage, e.g. *"the competitors almost pushed us out because of the time we lost"*, or it may be necessary to forge certain alliances in order for a projected timeline to be followed, e.g. *"the continuation of the project is in many ways dependent on Sahlgrenska [a hospital] and Chalmers [a university]"*. There may also be a kind of dissonance between the innovation process and the market in terms of time; that is the innovation may come on too fast for the customers. This is illustrated in the quote: *"we risk being too early in our process so that the customers are not yet ready to outsource the system administration we need for the venture."*

Time negotiation

This category has to do with innovator's conceiving of the meaning and impact of time and timeframes, as well as them using time as a strategic resource to negotiate with other actors who have a bearing on the innovation. An example of the former is *"PF has gained time by thinking in terms of the venture first, and about the technology second"*. The following statement could exemplify the latter form of time negotiation: *"The most important thing was long term thinking. The market was promised nothing until earliest five to six years after the venture started"*. Finally, the import of time may be dependent on how external actors choose to behave, and this may be a strategic consideration for the innovator, e.g. *"The most important thing is not to get the product out on the market after a certain time, but rather to get an outsider to validate the specific technology"*.

Innovators time

Time and self-constitution

The passage of time in the venture pertains in a fundamental way to the personal constitution or self-perception of the innovator. In hindsight the history of a successful

venture becomes proof of self-efficacy, e.g. *“Without my drive this wouldn’t have happened ... You have to push forward were you can make a difference”*. Time spent as an innovating entrepreneur is sometimes also seen as affecting important beneficial aspects of the ‘innovating self’, e.g. *“Inexperience is necessary. They’re so young and naive that they don’t grasp how difficult it is”*. The opposite may also be inferred e.g.: *“With the backing of experience, one does not have to be as careful as in the beginning”*.

Envisioned futures

The time dimension is present in the venture in terms of envisioned goals or futures. Often the goal is absolutely key to the concept of innovation. This may be exemplified by the quote: *“We select a number of goals, and then choose a road to get there... We work towards a goal”*. There are also more well known examples in the interviews of how envisioned futures may be used as a strategic resource in order to get things done, e.g. *“Several actors have been activated by citing visions”*. Albeit intuitively important for driving an innovation forward, it seems as if from one perspective envisioned futures may have a negative effect. One innovator said for instance: *“Next time I begin a venture I won’t start from an idea but rather from the will to start something [...] Earlier the group developed a vision...this hampered our work.”* Although this last quote was not typical, it should be kept in mind as it deepens our understanding of how the envisioned future plays an important yet ambiguous role in innovation.

Time and uncertainty

Time and uncertainty seems to be inextricably interconnected. One important aspect of the innovative venture that emerged in the interviews was that while objectives might be clear, the future is always uncertain. The passage of time introduces an element of uncertainty that the innovator can choose to deal with in different ways. One of the interviewees expressed it like this: *“Sometimes one wonders about the business model, but then again, there will always be ups and downs no matter what one does.”* While this innovator reduces personal uncertainty about the future by referring to the experience that fluctuations will always occur, another interviewee saw the time and uncertainty as more tied to the product: *“the uncertainty implied in starting up something like this is that one doesn’t see clearly were one is going. One doesn’t know all of the commercial possibilities of the product.”*

Outlook and faith

This category has to do with the innovator's general future orientation as being one of trust in him/herself or in the idea, or as having a general outlook of confidence in the process of creating something that is new and worthwhile. This attitude may be dependent on how the innovator recognizes the perceptions of others as having an effect on him/her, e.g. *"In presentations [of the venture] I have realized that I have to emphasize my own strong involvement."* Often outlook seems to have to do with the innovator's perception of him/herself as a particular type of person, e.g. *"...then I guess that as an entrepreneur one is basically an optimist."* This identity-outlook nexus may even be more distinctly professional. One of the interviewees reported that: *"I believe that the optimistic outlook can partly be explained by my being an engineer. Another explanation is that as a researcher one is used to not being able to follow everything up. Not reaching 'all the way' may be catastrophic for a consultancy company, but it is part of everyday life for researchers"*. These sentences say something about what professional identity can add to the faith or outlook in a venture. For the innovator, outlook or faith does not always imply optimism and positive evaluations of future opportunities, rather as one interviewee reported: *"The key is to find a middle way ... wishful thinking may be just as damaging as having a too bleak imagination...moderate your aim."*

Discussion

The higher-order concepts and the subsumed categories are first steps towards understanding how innovation and time relates among venturing entrepreneurs. So far we have only but scratched the surface of a vast phenomenon. It is not clear whether what we have seen in our interviews corresponds more to actual situations and events, or whether the narratives presented to us should be interpreted as perceptions of events, i.e. a study of innovators perception of their activities.

It is probably simplest to say that what we have studied are events past and expected, told by perceiving innovators in a specific way. Their experiences can and should not be set apart from actual events, especially not since the ambition of this paper is not a handbook for time management in entrepreneurship, but rather an

account of how time and innovative activities merge together in a seamless web of meaning; our ambition being to catch some of that meaning.

We saw in the quotes above that time is often perceived to be a force (i.e. *time as force*) in and of itself that exerts pressure on the innovator and the venture. The concept of time as a force is probably a common experience; it is not particularly dependent on the kind of activity or person having it. Nevertheless, it seems as if in the ITV, where strong commitments are built up while at the same time the processes are characterized by a large amount of change (Meyer & Marquis, 1969), time becomes more urgent and represents a stronger presence. This may have to do with, and to a certain degree explain, what we earlier referred to as the purposive adaptation of means to reach a preconceived end (Turro, 1986). Purposive adaptation thence becomes a more multifaceted concept than we previously understood it to be, namely that the innovator adapts the force of time as well as the more “physical” aspects of the innovation.

The categories of *future in the past* and *future in the present* puts the emphasis on the time dimension of earlier and present activities, and goes beyond any trivial conception of time and action. In fact, much like the actor on a stage the innovator here seems to develop an increasing awareness of time, in the sense of past and present events, as being a factor that influence the viability of the projected trajectory of the venture, or the venture’s ‘innovation script’. He/she has to ask this script: “-will I be able to finish in the time allotted to me in the play? - How can I secure my role?” Of course the innovator can take shortcuts, ad-lib a new script, or find ways of prolonging the play. In any case, time has now become a force to be reckoned with, which can affect change in its own right.

The interview material also gives us an indication of the significance of a time characteristic that we are familiar with since Einstein. Time is fleeting in the sense that it is made up of continuous chains of events that all have their own local significance for the innovator. Earlier in this paper we discussed Zahra and George’s (2000) notion of the independent venture as a coherently chained process of events rather than the more fragmented and divisionalized process found in larger company ventures. The category of *time strategy and learning* brings to the fore specific ways in which the independent innovator acts *vis a vis* this continuous process and uses it for adaptive strategizing and learning. The relevance of these continuous event chains for the development and identity of the innovator should probably not be underestimated.

They provide the person(s) behind the innovation with a sense of coherence and accountability that may not be equally present in the larger company context. Given this sense of coherence, factors like high *tempo* and fast *pace*, become internalized choices of the innovator rather than externalized evils. This is a strong concept in terms of how we conceive of the innovator as an actor who is striving to affect the world.

The higher-order category of *relational time* stems originally from Leibniz, and emphasizes the embeddedness of events in a relational context of people and things. This context is important in order to make sense of what something means in the context of other events. Apart from events this context may even include other time lines, where the interpretation of time can be a social actor in itself that forces people and events. Conversely then people and events may also force the unfolding of other's time in order to, for instance, speed up a innovation process. In terms of social dependence, time thence becomes a causal or an effect variable with respect to the innovation process.

This is true in the intuitive sense that losing from or adding to your time line may put you in an advantage or a disadvantage, and you may have to create certain social constellations if your time is going to be just enough. In the innovation literature this insight extends the writings on so-called 'timing' of individuals and groups where such response has traditionally been seen as caused mainly by external pressures (Bartlett & Goshal, 1991). It also brings to bear on our understanding of the reflexive attitude of the innovator (Chell et al., 1991), i.e. his/her ability to reflectively take another actor's position, in that it emphasizes the possibility to enter into a negotiatory mode with respect to time itself and not as would have been expected, merely with respect to other actor's time resources.

The conception of *innovator's time* is especially interesting in this last regard. Here we can see how the innovator constitutes him/herself *qua* innovator/person in close conjunction with time categories. The reasoning here is that self-efficacy may come about in the tracks of an innovative time line, or even in the absence time spent innovating. It is interesting to note that both lack of experience as well as abundance of it (i.e. time spent as innovator) seemed to be good explanations of a pro-active venturing personality. We have also argued that *outlook and faith* of the innovator is related to how he/she realizes a professional ethos of involvement and constructiveness. It is possible in this respect that depending on the time spent as an

independent technological innovator, spontaneity or professional ethos may play relatively different roles, but possibly with similar effects if in the same person.

Envisioned futures lends further complexity to the relation of person and time in innovation in that the goal setting and goal directedness referred to by Nightingale (1998) implies a conception of the future as being sticky enough to project visions onto, but at the same time malleable enough to be changed into the desired state. In our opinion this concept thence connects a natural personal attitude of weak constructivism, with the fact that time introduces real uncertainties that will have to be dealt with. But rather than simply seeing the innovator as a person who exploit uncertainties and ambiguities (Lowe, 1995), we are able to discern from this complex an innovator who develops and maintains a reflexive attitude *vis a vis* the world *qua* script, resource, goal and restriction, that comes very close to the actor/scene metaphor touched upon earlier.

Conclusions

This paper has aimed to investigate time and innovative entrepreneurship in so called Independent Technological Ventures (ITVs). The study found that time is, not merely an autonomous variable affecting the innovation process, but rather an existential dimension for the innovator which is enacted, used and affected in a diversity of ways during this process. This is to say that time and innovation cannot be viewed as independent factors, but as existentially intertwined in ways that are contextually meaningful to the innovator. The ways that the interviewed innovators reported on time and innovation, led us to develop four concepts from which to understand this intricate interplay: i.e. time as a force, as a flow, as relations and as personal, cognitive resource. All these concepts tie in with the process of innovation as emerging from the innovator's experience and actions, and help us understanding this involved process of creation.

In our view, the concept of innovation has been investigated under the assumption that novelty and commercialization are the most important components to be reckoned with. Our study however put forward intentionality, uncertainty creation, vision and social action as being the most significant denominators of this phenomenon. The application of a time perspective onto innovation helped us see these categories more clearly, perhaps because of the fundamental significance of time

to all human (and physical) endeavors. As has been evident, we do not offer any normative implications for how to better manage your time as an innovator, but only (hopefully) a glimpse into the descriptive complexities of the phenomenon.

Notes

1. It has become common to refer to the innovator as the person who comes up with the idea or the invention, i.e. who is central to the ideation and concept phase of the innovation cycle, and to the entrepreneur as the person who takes the concept to the market place. In the case of ITVs this distinction is wanting for simple reason that the same person(s) often play instrumental roles in the whole of the chain of innovation, i.e. from the concept phase, over development, prototyping, industrialization and commercialisation. Thus these individuals should be referred to as “innovators” rather than entrepreneurs, in that they engage in innovation rather than just commercialisation.

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