

# Young Dreamers: An Explorative Study on How Techno-Starters Look to the Future

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## Abstract

*We present an explorative study of 43 techno-starters in the area of Delft University of Technology in the Netherlands. The leading question is how these young technology-based companies look to the future, and which factors determine the use and scope of explicit futures research methods and the length of their time horizon. Six hypotheses are tested against the data collected from interviews. There are no statistically significant conclusions, but some trends can be identified. Externally financed techno-starters appear to be more inclined to look at the future, and this tendency is stronger when more money is involved.*

**Keywords:** futures research, techno-starters, entrepreneurs, time-horizon, technology-based companies, future vision

## Introduction

Many innovations do not originate from large companies, but are initiated by a subset of small and medium-sized companies (SMEs) known as techno-starters. These techno-starters are often located in the vicinity of universities and established by students, recent graduates and/or former employees (including PhDs) of those universities, who try to turn their academic knowledge into a viable business.

From personal experience we know that the decision of originators of these entrepreneurs to start their own company (instead of joining a large organization) often is an intentional and well-considered choice. Most techno-starters fear that working for a large company will limit their creativity and their freedom to explore their entrepreneurial mindset. Indeed, it can be assumed that

entrepreneurs are different from ordinary managers within large companies. They have a more informal and flexible attitude, they are willing to take greater personal and financial risks, and they work harder. More and more it seems that these personal characteristics are essential to succeed in the 'new economy', and that the 'classical' manager does not meet these changing demands. However, scientific research is not conclusive on this matter, despite the apparent distinction that entrepreneurs and managers come from different planets.

Another important difference between managers and entrepreneurs may be their attitude towards the future. Managers make detailed and extensive plans for the future, although they often realize that the future cannot be entirely planned. Actions and decisions by competitors can affect a company's future. An important characteristic of their attitude is that they deal with the future in an *explicit* and *formalized* way. They make forecasts or scenarios and use these in their decision-making processes. We would assume that entrepreneurs do not look to the future in an explicit and formal manner. They do not have the financial and personnel resources to set up a special department of futures research and to carry out studies of the future that can be used in their decision-making processes. Nevertheless, according to Loveridge (2001, p.786), entrepreneurs "...believe they possess the acute perception needed for real foresight" although some entrepreneurs are "adroit at rediscovery", Loveridge adds. Carland, Carland & Stewart (1996) also see 'entrepreneurial vision' as that which entrepreneurs have in common. Boyd & Vozikis (1994) regard vision (intuitive/holistic thinking) as an important contextual factor of 'entrepreneurial intentionality'.

Entrepreneurs – at least the successful ones – can be seen as the starting point of large enterprises. As a result, we would expect that the larger a techno-starter becomes, the more explicit and formal his approach to strategic planning in general, and to looking to the future in particular, will be (Berry & Taggart, 1998)<sup>1</sup>. According to Van Gelderen, Frese and Thurik (2000) at least some planning is necessary to ensure business success. A necessary condition is that smaller companies acquire knowledge and experience in these management techniques (Graaff, 2003).

In short, what managers and entrepreneurs have in common is that they are both interested in future matters and that they both realize that their business success lies not in the present but in the future.

## Techno-Starters and Looking at the Future

This paper deals with the way techno-starters look to the future. In this section we define the two pillars of our research: techno-starters and looking to the future.

### Techno-starters

We used a pragmatic definition of techno-starters to decide which companies to include in our research sample and which companies to exclude<sup>2</sup>. We ignored how techno-starters are defined in the literature, but instead asked governmental and government-related organizations involved in developing and implementing policies pertaining to techno-starters how they define this type of businesses. Some definitions put emphasis on high investment costs, quick business growth, and facing big busi-

ness risks, while others took a broader approach and stressed the new technology these companies use and the academic background of the founders of these companies. Based on these definitions and characteristics we came to the following definition:

*Techno-starters are recently founded high knowledge-intensive companies which develop new products, processes, or services based on new technology.*

Of course, a definition is never perfect. Some techno-starters use existing (not new) technologies and apply them in a different (new) context (industry) or in a new business model. It is important that our definition does not exclude companies that are generally regarded as techno-starters. To select techno-starters to be interviewed we limited our sample to techno-starters located in and around Delft. These companies had to be registered at the Chamber of Commerce, to distinguish 'real companies' from enterprises of people who were merely toying with a technology-based idea.

### **Looking at the future**

Looking at the future is undoubtedly one of mankind's oldest activities (Sherden, 1998). After the Second World War, looking at the future became a serious activity. Initially, it was carried out mainly by governments, military organizations, and large R&D-organizations, and it predominantly involved forecasting technological developments (Coates et al., 2001; Gerybadze, 1994). Presently, almost every organization (commercial and non-commercial; big and small; involved or not involved in technology) is engaged in some form of looking at the future (Burmeister et al., 2002). Most approaches to futures research (as this discipline is called) explore rather than predict the future and technological developments although sometimes predictive and explorative approaches of futures research are combined (Masini, 2001; Bouwman & Van der Duin, 2003). In this paper we follow the definition of Berkhout et al. (2007):

*Futures research is the ability, the competence and the art of describing, explaining, predicting, exploring and interpreting future developments and its consequences, as the result of actions and decisions in the present.*

For companies in general, and for techno-starters in particular, looking at the future is an essential activity. Developing new business (innovation), whether or not on the basis of a new technology, means having a vision of the future for which the company is developing an innovation (Twiss, 1992a). Every business opportunity lies in the future. Because developing an innovation or setting up a new business takes a lot of time, one or more views on the future are needed to assess its 'future-proofness' (Van der Duin, 2006; Twiss, 1992b). In general, paying attention to the future is considered an important capacity for doing business successfully (Preez & Pistorius 1999; Johannessen, Olaisen & Olsen, 1999). This is valid for each type of company, large or small.

Most research on the factors that can explain future business success are aimed at new products and services and less at organizations (e.g., Van der Panne, Van Beers & Kleinknecht, 2003). In the case of techno-starters, the organization and the product (or service) are one and the same, so that predicting the future success of a product or service equals predicting the future success of a techno-starter. The only difference is

that in predicting successful techno-starters additional factors (such as organizational and technological factors; see Park, 2005) play a role as well. Stuart & Abetti (1987) did this for 'new ventures' (which may be compared to techno-starters) but could not identify any future-related success factors. Cooper (1993) argues that predicting the success of new companies is extremely difficult, because of the many differences that exist between them, because of the many variables that may be responsible for explaining the success of a new company, and because no theoretical framework has been sufficiently developed yet. Bird & Jelinek (1988) emphasize the importance of looking to the future to estimate the success of a company and for describing entrepreneurial intentions. In their view, it is mainly the 'clarity of vision' that determines venture success. By communicating a clear and consistent vision to stakeholders (employees, clients, investors) entrepreneurs can convince them of the qualities of the *techno-entrepreneur*, which makes it easier to ensure their commitment.

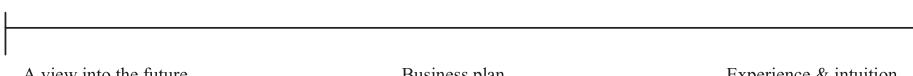
## Research Structure

Even though serious futures research only began after WWII, a lot of research has been devoted to it since. Much research was conducted on how large organizations (both commercial and governmental) look at the future, and how they use this knowledge to make decisions (Van der Duin, 2006). Research ranges from developing new methods of futures research, investigating to what end futures research is used, assessing the impact of futures research on decision-making, to evaluating the process and content of futures research. Most of these studies focus on large organizations only. Although the way SMEs look at the future has been investigated, albeit to a lesser extent (see for instance, Savioz, 2004; Van der Duin, 2006), little research has been done on how (young) entrepreneurs deal with the future. There is an apparent lack of data on how small companies look at the future.

Based on their entrepreneurial attitude, one may assume that entrepreneurs view the future in a more informal and *implicit* way than managers do. They are probably not exploring the future using all kinds of scenarios, but rather *shaping* the future: establishing their own preferred future. Entrepreneurs want to make their dreams come true.

It is important to recognize in advance that techno-starters are unlikely to explicitly use the various formal methods of futures research, and that they do not have a clearly defined process for doing so. Only large organizations like multinationals and government agencies look at the future in such a way. The smaller the organization, the more implicit and less professional the approach to the future will be. One possible reason for this is that smaller firms have less access to the resources required for looking at the future. They usually lack financial leeway to divert manpower away from operational matters and towards developing a focus on strategic long-term issues. Another reason is that it is easier for large organizations to survive structural economic cycles – they have 'deeper pockets' (Cooper, 1993, p.241). Large companies have enough financial resources to also look to the future when (economic) times are bad. When times are less than favorable, smaller companies are more likely to devote all their attention to operational issues, simply because their first priority is survival.

'The urgent drives out the important', a famous quote from Henry Kissinger, primarily applies to smaller companies (and certainly to techno-starters) because they are still in the start-up phase and often do not have many customers or a sufficient turnover. Our research among techno-starters indicates that *implicit futures research* appears in three forms, which lie on a continuum:



*Figure 1.* A continuum of implicit futures research.

The main advantage of investigating futures research within large organizations is that their use of explicit futures research makes it easy to collect useful data. This advantage is absent in smaller companies (and especially techno-starters). When we tested our interview protocol, some techno-starters simply did not understand certain concepts. Many techno-starters were unfamiliar with the term 'futures research', and the word 'innovation' raised many a puzzled eyebrow. These wrinkles were ironed out by explaining what these concepts meant. In many cases the interviewees spontaneously started using other terms to verify for themselves what it was that we meant. For instance, futures research was associated with *predicting the future*, and innovation was often described as *product development*. In summary, it became clear that it is very difficult to investigate implicit processes in small organizations, especially if they use a different frame of reference from the one the researcher uses. This is why we opted in favor of linking the open-ended questions (and answers) to concepts that are more easily measured objectively, like start-up costs, number of employees and the time horizon of the techno-starters.

In summary, in this paper we investigate how techno-starters in the area around Delft University of Technology look to the future. We also address the questions: how long is a techno-starter's time horizon? How do techno-starters come up with their 'dream of the future'? How and how often do techno-starters update their dreams of the future? And to what extent does a vision of the future help techno-starters in the way they operate their business?

We did a literature search on previous research on techno-starters and futures research. We checked 17 scientific journals and three scientific databases, using keywords, such as 'business future', 'futures research', and 'future vision'. We found no relevant papers, which lead us to conclude that there exists no theory on how techno-starters are looking at the future by using methods of futures research.

To answer the research questions above we adopted an exploratory research approach to search for 'building blocks' to create hypotheses (or even a theory) for explaining how techno-starters look to the future. To structure our research we formulated six initial hypotheses:

1. If more money circulates in a techno-starter (start-up costs or turnover), more time will be spent on futures research.

2. Techno-starters who experience a strong growth in the number of employees are more inclined to look at the future.
3. Techno-starters who have received external funding look further ahead than those who are funded internally.
4. Established techno-starters look further ahead than recent techno-starters.
5. Techno-starters with a large workforce are more likely to start investigating the future than those with a smaller workforce.
6. Techno-starters with a shrinking workforce do not explicitly explore the future.

To answer the research questions we conducted semi-structured interviews with 43 techno-starters. To ensure that we had a uniform geographic sample, we interviewed techno-starters in the Delft region, preferably close to Delft University of Technology. The interview protocol was first tested on seven techno-starters. Each interview was transcribed and the interviewees were asked to make adjustments and to provide general feedback.

## Results

To create some structure in our sample of techno-starters, we classify them in three ways:

1. By their product or service: information and communication technology (ICT), consultancy, medical/pharmaceutical, consumer products, chemical products, innovative product development. These categories are not mutually exclusive. For instance, a medical product can also be a consumer product. What is important here is that the product or service can be regarded as the core business of the company.
2. Was the product or service developed through technology push or through demand pull? By technology push we mean that a product was developed with technology as the starting point, whereas by demand pull we mean that the market served as the starting point (a techno-starter who fulfills a market demand). Because the development processes vary, it is useful to make a distinction between these two mechanisms, keeping in mind that it is not always clear whether a product is based on technology or on the market, and that processes can be inspired by both sources.
3. By the startup costs, divided into three groups: up to E2,500, between E2,500 and E25,000, and over E25,000.

With regard to their product/service, most techno-starters (22) fall into the category of ICT, while the remaining techno-starters are more or less equally divided among the other categories, with a slight emphasis (8) on consultancy<sup>1</sup> and a slight under-representation (2 each) of consumer products and chemical products. Technology push is slightly more common (17) than demand pull (13), while that distinction could not be determined in the remaining 13 cases. The startup costs criterion divides our sample in three roughly equal groups: 11 techno-starters needed less than E2,500, 18 techno-starters require between E2,500 and E25,000, and 14 companies started with more than E25,000. The former category includes mostly consultancy and ICT companies which do not require large initial investments in equipment, while the latter category

contains mainly medical/pharmaceutical and innovative product development companies that have high initial costs for equipment.

We correlated these three classifications with distinctive features from our research questions, such as the presence (or absence) of future explorations and the length of the time horizon. For the product/service classification, we found no clear relationship between the type of product or service and the time horizon. Although ICT techno-starters claim to have a large time horizon, they also find it difficult to look far ahead. Consultancy and medical/pharmaceutical techno-starters have the shortest time horizon and show no intention to carry out new explorations of the future. Technology push techno-starters are more involved in futures exploration than demand pull companies, probably because they rely more on external funding. Techno-starters with high startup costs look further ahead than those with low startup costs, most likely because it takes longer to earn back a high initial investment.

## **Concluding remarks**

Our conclusions are determined by testing the six hypotheses against the research data.

### **Hypothesis 1**

If more money circulates in a techno-starter (start-up costs or turnover), more time will be spent on futures research.

Futures explorations of larger techno-starters are more extensive than those of smaller ones, and their time horizon is longer. It turns out that techno-starters adjust their time horizons at certain times. Financially larger techno-starters may reduce their time horizon after some time. That means that the time horizons of the two types of techno-starters tend to converge over time. This hypothesis can be confirmed.

### **Hypothesis 2**

Techno-starters who experience a strong growth in the number of employees are more inclined to look at the future.

Six out of ten techno-starters with the highest growth in the number of employees have no intention of renewing their futures exploration, while five out of ten techno-starters with the smallest growth in their workforce have no intention of doing so. This implies that there is no relationship between the workforce growth of a techno-starter and the decision to update the existing futures exploration. The dynamics of the techno-starter (in terms of the growth of the workforce) does not influence the decision to start a new futures exploration.

### **Hypothesis 3**

Techno-starters who have received external funding look further ahead than those who are funded internally.

Techno-starters that were funded externally look four years ahead on average, while techno-starters with internal funding look only two years ahead. Therefore, this hypothesis can be confirmed.

### Hypothesis 4

Established techno-starters look further ahead than recent techno-starters.

Both established and recent techno-starters have fairly short time horizons. Techno-starters who are closest to the average age of the entire sample tend to use the longest time horizon. This implies that this hypothesis cannot be confirmed.

### Hypothesis 5

Techno-starters with a large workforce are more likely to start investigating the future than those with a smaller workforce.

Only four of the ten largest techno-starters intend to update their futures exploration. The number of employees of a techno-starter is not related to the intention to update the existing futures exploration.

### Hypothesis 6

Techno-starters with a shrinking workforce do not explicitly explore the future.

Techno-starters who had to reduce their workforce often do not have explicit futures explorations, but only a business plan. In addition, they use a short time horizon. This hypothesis may be accepted.

## In Summary

Three of the six hypotheses are confirmed (1,3,6), two have been rejected (4,5) and one is not significant (2). Although it is difficult to reach an overall conclusion from these results, we can generally say that larger techno-starters pay more attention to the future than smaller ones. Especially in the light of the financial aspects (start-up costs, funding method) this becomes obvious. The size of the workforce and the growth (positive or negative) has little influence on the way techno-starters approach the future. We may tentatively conclude that techno-starters mainly look to the future from a financial point of view, possibly enforced by the people who provided the funding. Apparently, the organizational aspects of the techno-starter play a less significant role.

One overall conclusion is that our sample of techno-starters presents a rather mixed picture, which is not unusual. There exists no prototypical entrepreneur (Stewart et al., 2003). Although there are some connections, it would appear that techno-starters, despite similarities in terms of their geographical location and application of advanced technology, are too diverse to warrant generalized conclusions. This may be because the sectors in which they operate are too different. Also, it is fair to say that the personal motivation and background of the individual techno-starters (and with it their subjectivity) plays a prominent role. When a techno-starter starts to grow, we may assume that the organization becomes more professional and that entrepreneurship migrates into management. When that happens, the way the organization deals with the future will have to be determined and made explicit. That means that conducting futures research becomes more explicit.

## Discussion

This study did not yield any concrete conclusions. One obvious reason may be that we researched only a limited number (43) of techno-starters. Ideally, we should have investigated a larger population that also includes techno-starters from other regions. A larger population generally leads to more tangible results. The diversity in the relationships between the techno-starters and futures research does not help us to draw solid conclusions either. Maybe we should have focused on a sample of techno-starters with a common product or service. It may also be valuable to monitor several techno-starters for a longer period of time (longitudinal research), to observe the changes they experience in their approaches to the future.

We would like to compare some of our findings with existing literature on techno-starters and the future, but we did not find any relevant prior research that addresses this topic.

As stated in paragraph 2, the future and entrepreneurship are closely linked. There is empirical research which indicates that a vision for the future is a condition for business success. Ensley, Carland and Carland (2000) indicate that this is also true for entrepreneurs. They distinguish between 'ordinary' entrepreneurs and 'lead' entrepreneurs, and argue that lead entrepreneurs are better able to develop and communicate an entrepreneurial vision than ordinary entrepreneurs. In addition, Tellis and Golder (1996) found a relationship between the 'vision' and the likelihood that a first-to-market entrepreneur will be successful. They argue that one of the factors that determines whether early entrants are successful is their vision of the future: "Market leaders are firms that can *envision* the mass market for these primitive innovations. Firms that can define that vision can assemble resources and inspire people for the task ahead" (p.73). Regarding the time horizon of the techno-starters in our sample, it appears that externally funded techno-starters are less concerned about being an early entrant than internally funded ones. A possible explanation is that externally funded techno-starters have a large enough financial buffer to allow them to determine when to enter the market. Apparently, they find it less appealing to go through a trial-and-error process that involves continually testing their ideas, products and services, and thus having to operate within a shorter time horizon.

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## Notes

1. Kuratko, Ireland & Hornsby (2001) show that both types of enterprises are also combined by describing a case in which a large(r) enterprise succeeded through 'entrepreneurial actions' in realizing the future vision of the company.
2. With regards to quoting and discussing literature that is relevant to our research, we adopt a broader approach, and treat techno-starters, entrepreneurs, small businesses and ventures as a relatively homogenous group.

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## Appendix

### Sample of techno-starters

1. 1A first alternative
2. Connectux
3. Multi Sensor Systems
4. Momentum Technologies
5. 7 / U
6. ISD
7. Zmart
8. Eonic
9. Direct Access
10. Dynamic Display Info
11. Frontend
12. Matbase
13. Hinttech
14. Carya Automatisering
15. CNOC
16. Loyal ICT
17. Auxilium Software Development BV
18. Easy Way
19. Habanera
20. Exa Omicron
21. Bateau Knowledge
22. Nétive
23. Advanced Lightweigt Engineering
24. Tweensense
25. Anaproc
26. D3K Simulations and Consultancy
27. Intrascan
28. Materials Innovations Centre
29. Ursia Minor
30. Demis BV
31. Foldyne
32. Dymomics
33. Delta Tech
34. Hlthpool
35. Ergodynamics
36. Sunshower
37. Clea Technologies
38. Nano Fill Systems
39. Mapper Lythography
40. Mat Tech
41. Tytecker
42. Delft Geosystems
43. Recycling Avenue

## Interview protocol

- *What is the nature of the product? (ICT, Industry)*
- *How did the idea for the product/company come about?* Did it start with a technical idea and lead to a problem (technology push) or did it begin with a problem and lead to a solution (market pull)?
- *What were the start-up costs of your company?* Low (less than E2500), medium (E2500 – E25,000), high (more than E25,000). How was it funded? (bank, shares, etc.)
- *Did you conduct futures research when you started the company?* Why do you conduct futures research? Was it under pressure from external investors? Simple, or extensive?
- *Did you make the futures exploration concrete or explicit?* (Yes, No). If yes, in what form? (Business plan, memo to colleague's). How did you carry this out? (for instance brainstorm). In what terms did you make the futures exploration concrete? (Profit projection, market growth, growth in workforce?).
- *What was the time horizon of the initial futures exploration/expectation?* (months, years)
- *If you were to meet an oracle that could predict the future, what questions would you ask?*
- *Which factors play a role in the using your futures exploration/expectation?* (Then and now)
- *If all goes well, how will your company develop?*
- *What value do you place on futures exploration/expectation?*
- *Have you had to adjust your initial vision of the future?* If so, what was the reason?
- *Are there any futures explorations planned* (Yes, No). If yes, why are they planned? What are they supposed to look like? What are your expectations?
- *What is your current time horizon for futures exploration/expectation?* (months, years)

