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13 inspiring stories by corporate intrapreneurs

BEAT THE UNICORN

Story 10

Atychiphobia: The Fear of Replacement

A story of how innovation processes occur in the engineering field and the resistance which is encountered when implementing innovations. That successful innovation hinges on four vital core issues: timing, expertise, vision and perseverance.

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Tauw

Introduction

People often believe the term innovation to incorporate more than it actually does; like creating new ideas. Innovation is the process of transforming concepts into products or services that we can use in the market.

> Rather than focussing on invention, innovation relates to the manner in which to (commercially) successfully implement such 'inventions'.

Moreover, we make a distinction between product innovation and process innovation, in which product innovation focusses on new products (mobile phones, electric cars, etc.). Process innovation usually involves internal processes (how can we improve our work processes?).

So what are the problems I encounter in my work as innovation manager at Tauw? What in our business do we consider 'innovation', and how do I see to it that we are successful in the world of engineering? Success in my case is subject to several interpretations. I consider myself successful when I implement new technological concepts into our daily operations, thereby improving or expanding the scope of our products and services. I shall use several examples to illustrate my quest, within which I shall also clarify my thought processes with regard to the Unicorn start-ups; what can I learn from them and how can I create an innovation that revolutionises the entire industry?

First the theory

In theory there are several innovation processes. Voort & Ormondt (2011), for example, developed the VIM model (Value creation, Innovation and Management of innovation), in which the innovation process is dedicated to 'Value creation' in the initial phase of the process, and to 'Innovation management' in the final phase. All elements are of equal, vital importance.

In the first phase we have to assess what use the concept has. Why would we want to create the innovation in question? Ours is not a large playground in which we have fun experimenting with technological development. Ours is a commercial environment in which we have to create added value. This added value can be broken down into various components: better insight, more data, cheaper methods, faster processing, etcetera.

"I strongly recommend that potential customers be involved in this process, seeing that they are usually in a position to benefit from the advantages."

The customer might be a 'launching' customer, in which case he plays a vital role in generating business from an idea, but the principal objective is to create a new product for my internal clients; colleagues who are end users and benefit from the process innovation.

Dreaming, Deliberating, Daring and Doing

When we have assessed a concept for its value, we need to further substantiate the innovation process. We have to work out the concept according to a phased approach, in which we structurally ascertain whether or not the concept offers added value and whether or not it provides sufficient basis for a comprehensive business plan. Applying the four-D principle (part of the innovation steps of the VIN-model) works very well in what I do: Dreaming, Deliberating, Daring and Doing. It all starts with Dreaming: Where do we want a technical development to lead us?

Dreaming

The four D's are best explained with an example. Tauw is currently developing a concept by the name of 'The field worker of the future', in which we use Google Glass in a variety of applications. These smart glasses allow us to project digital project data (such as objects, cables and ducting), so that the field workers can focus on the work he has to do.

We can also use the glasses as a sensor. The glasses then instantly process the images it absorbs. The options are endless. Take measurement data that we cannot observe with our eyes, for example. We can visualise an organic substance within the hyper-spectral range; by looking beyond the spectrum of visible light (infrared and ultraviolet), we can observe things that are invisible to our eyes. The glasses immediately process those data

and visualise key aspects that we otherwise could not see. Other aspects such as moisture, sediment-related discrepancies and organic pollution can also be dealt with in this process. In addition, we can use our voices to add information to the underlying database.

In my vision, these glasses are an extension of the employee and can simplify and provide support in a broad range of activities. However….. you have to be incredibly well prepared if you want to formulate this as a business plan, get it off the ground and secure funding for the required investment. The entire process must therefore be thoroughly deliberated.

Deliberating

The process consists of several phases that already lead to a functional addition to our daily working process as an intermediate product. Apple, for example, did not immediately introduce its latest iPhone X. This was done in stages (several other models were launched after the first iPhone), and each stage was exploited for its commercial potential.

"The art of this process is to create enough added value in each of the new models and to present this in such a way as to mobilise and attract customers (rather than taking them to the customer)."

For our Google Glass project the first step will be to present certain categories of data, accurately and in true detail; visualising the location of cables and ducts on a screen is the first small step required in making our dream come true.

The same applies to our innovations. In the Deliberation phase, we distinguish realistic steps that can be dealt with in the short term. In creating our concept for the glasses, we set out our objective of projecting digital data, such as the location of cables and ducting. Data such as these have to be processed very quickly and must be completely accurate and reliable.

Daring

The next step is Daring; daring to share the concept with the market. Together we are stronger, and together we might find new insights. During this process, market parties provide insight into their needs and also provide answers as to why the innovation is useful. On the other hand, we also run risks. What if the innovation 'fails'. Will that harm our relationship with the customer? In my experience, most customers appreciate the fact that we pursue innovation, especially if we are open and forthcoming about it. As long as we don't make promises that we can't keep, the customer will hold nothing against us.

"I also believe that there is no such thing as a 'failed' innovation."

A concept might not always lead to the desired final result, but it always deepens our insight. The question is then: how do we use that insight? Do we use it to decide on a different approach the next time around?

For the Google Glass project we have consulted several industrial customers, and we are performing our first pilot out in the field. The results so far are very promising.

Doing

We found a customer who was willing to launch our glasses-concept as an experiment at his location. This is when we proceed to Doing: setting up a pilot or test in order to find out whether or not the desired innovation will ultimately generate added value. That is where we are now, which to me is the most exciting phase. Is what we have come up with realistic and feasible? Will it generate the added value we expected, will it lead to other insights, and how can we use the information to successfully complete the following phases?

We hope that the outcome of the Google Glass pilot will be successful and that company-wide implementation will follow. The project is comparable to the market introduction of the first IPhone: a virtual GIS (Geographic Information System) that creates immediate added value for the users. I hope that our vision will become increasingly visible as newer versions of our Virtual GIS System are introduced.

Implementation

The process now enters the implementation phase, Innovation Management. Based on our findings, we can now draft a comprehensive business plan, in which we compare the total investment with the revenue (based on experiences and expectations acquired during the process). We also assess the options for subsequent innovations. For the consultancy sector, the implementation phase brings considerable risks. It requires other qualifications from the engineers, and it is often wrongly thought that the process stops there. The persons responsible for carrying out the first two phases identify new developments or challenges before fully implementing the business plan, and no qualified representative takes over.

"This is why a cohesive team has to be formed."

A strong team facilitates them and provides everything they need. Only then can this phase of the process take off, and only then can the level of success of the innovation be ascertained. Personally, I recognise this "problem". I see new ideas, but I also know that I have to complete my previously started developments. I know that I need success if I am to be given the opportunity to start new developments.

Why did I become an innovation manager?

I stepped into the world of environmental consultancy as a chemical process engineer ten years ago. During that time I was mainly involved in complex soil research and on-site soil remediation. I soon concluded that this type of work had to be performed out in the field, not in the office. That's one of the nice things about the world of on-site soil remediation: we don't kick problems down the road, we solve them by providing tailor-made services and on-site soil remediation based on chemical, physical and thermic techniques.

Contrary to on-site remediation, we still do our research at the laboratory of the company. We gather soil/water samples on location and transport them to the laboratory for further research. So why don't we take the laboratory outside? After all, that's where the real work takes place. With that in mind, I began to use a hand-held XRF - an elementary analysis technique with which to ascertain the presence and level of heavy metals by means of X-ray fluorescence spectrometry. Today, ten years later, we have three of these devices in use on a daily basis in the Netherlands. We are rolling out the technique abroad, and the first legislative guidelines are (finally) being drafted. We can safely say that the use of the devices has been successfully implemented. The entire process was hard-fought and we encountered resistance from all kinds of disciplines, but we nevertheless achieved what we had set out to achieve. The 'icing on the cake' is what the Provincial Authorities of Utrecht, one of our customers,

said about the soil remediation for the river Vecht, in which they literally stated that they had more confidence in the results from the XRF than those from the laboratory.

I now apply the experience I have acquired to my work as innovation manager. How can I work out a 'concept' and turn it into a successful (commercial) product?

Why do we want to innovate as a company?

Innovation forms an essential part of our business procedures. This may sound new, but it's always been that way.

"In order to survive in the future, we have to stay abreast of new developments."

This enables us to be competitive and to generate new business. We always have to set a healthy mix of long-term and short-term objectives. One of our short-term objectives is to generate enough production capacity to meet the required sales targets. One of our long-term objectives is to guarantee the survival of the company in the future.

I don't think anyone would believe that there are still companies out there that did not move with digitisation and that survive without computers or mobile telephones. Still, it is possible to benefit from an

innovation in the short term. Being a pioneer and leading the market with (new) innovation is one way of keeping your competitors behind you. I make a distinction between four key elements: timing, expertise, vision and perseverance.

Timing, expertise, vision and perseverance.

The successful implementation of the XRF is one example of innovation in which timing, expertise, vision and perseverance all worked in our favour. We lead the market in this respect, even if we don't always have control over these elements.

Another example involves the use of drones within our field of expertise. I began investigating this option in 2010 by putting some of my concepts on paper, in particular about setting up pilot projects to test this possibility. I remember being laughed at back then.

"Those are toys and will never be a part of our business".

Now, eight years down the line, all we need to do is look at the various (social) media to understand the numerous possibilities and applications for drones. Drones are now tagged as one of the hottest technologies likely to change the world. Therefore, the successful implementation of drones depended strongly on the right timing in addition to perseverance, vision and expertise.

> More than 80% of all start-ups in those days came to nothing, but the remainder has swept the market.

Having the right timing is an art. It's easy to say that in hindsight, but at Tauw I was either too early or didn't show enough perseverance at the time. Nevertheless, I am proud to have drones operating at Tauw now. We use them in our daily activities and we continually conceive and develop new applications. Through periodical sampling, we are evolving towards a state of permanent measurement.

Two types of innovation

Technology advances at a tremendous rate. Devices that are used in the field of analysis technology are getting smaller and smaller, which makes them increasingly suitable for use out in the field. At the same time, the processing capacity of our computers is increasing, which in turn makes it possible to obtain more knowledge from data, let alone utilise the possibilities of 'machine learning' in the process. Obtaining data and using it smartly have become permanent aspects of our work. We have reached a point at which we are aware that this will have an effect on the world of consultancy. Rather than taking snapshots in time through periodical sampling, we are evolving towards a state of permanent measurement. Instead of reacting after the fact, we can anticipate situations on the basis of released results (online applications). The question is therefore no longer whether

we should innovate, but how quickly we should implement the changes that come with it, in which we have to always make a distinction between the types of innovations we create: process innovations or product innovations.

Process innovations

Process innovations are relatively simple to roll out once we have established their added value. Process innovations such as the XRF provide a basis for reorganising our processes, due to which we can speed up the rate at which we deliver products. In the case of the XRF, the outcome of measurements is made visible instantly rather than one day later. Other good examples are the use of drones for volume measurements and the use of sensors for water quality measurements. Developments such as these provide a foundation for smarter process organisation, which in turn enables us to create added value in comparison to our competitors. Indirectly, this also means that we would be giving our competitors every opportunity to outsmart us if we did not innovate, in which case we would be at a serious risk of gambling away our prospects for the future.

Product innovations

Product innovations are innovations by means of which we create new products or services. A very good example here is the development of a gamma spectrometer, a device that makes it possible to distinguish between

various types of sediment on the basis of their respective radioactive values. Traditionally, this type of research is conducted visually, the advantage of which is that a large area can be surveyed within a short timespan. Preparing for innovations such as these requires an entirely different approach, and the investment model often requires much more lead-time. However, fast products are also conceivable, such as the use of satellite data or other open source data with which to chart climatic effects within city centres. Good examples in this respect are flooding charts, heat wave charts and soil subsidence charts.

Other lessons learned

Over time, I discovered that several other aspects also play vital roles within this process. As a technician, I always used to focus on the technology, the basic aspect of the measurement principle and the corresponding added value.

A few years ago, I picked up a Near Infra Red sensor (asbestos meter) and took it to our Asbestos Inventory Department. I enthusiastically explained the background of the technique and told them about the possibilities I saw and the first test results that had come in. As a technician I had failed to consider the human aspect in this process, and the immediate response was: 'Not going to do that. Determining whether or not a material might contain asbestos is our job.

"We're not going to let a machine do that for us."

Having obtained some support from management, I was ultimately able to convince them that it might be beneficial to our work. The main trick was to mention that the system was not meant to replace their specialism, but to strengthen it. We ultimately purchased the device and we now know the extent of its use. Sadly, we have now met with resistance from the market. Dealing with this requires a clear vision and determination!

Resistance

Resistance from regulatory bodies is a formidable obstacle. You have to be very strong and persuasive to demonstrate the usefulness of a new technique. In the Netherlands everything is laid down in protocols and working arrangements that are based on the existing conventional technology. Results are presumed to be 'solid', but this is often quite the opposite in reality. If we look at soil analyses performed by a chemical laboratory, for example, the latest results regularly deviate strongly from the previous results. We accept this regardless, but to introduce new techniques you have to work out and present this issue in detail. I am obviously in favour of substantiating new techniques and validating the results of new methods, but I am always surprised when the conventional method is blindly assumed to be the right one just because protocols dictate this. After all, didn't we ultimately abandon our belief that the world was flat?

Let's again take the aforesaid XRF as an example. If used correctly, the XRF provides better and more accurate soil sampling results than the much more labour-intensive method of conducting laboratory analyses. Nevertheless, the powers that be often refuse to abandon 'embedded' systems and pay too little attention to the facts.

> Needless to say that a change of attitude is vital to the acceptance of results.

We have to continually enter into dialogue with the involved parties, stakeholders and testers to discuss our intended strategy. Decisive within these discussions is an emphasis on the fact that better answers can be provided for the intended objectives. This in turn requires an assessment of the core issues referred to above, all of which are essential to the entire innovation process: timing, expertise, vision and perseverance.

Is there an ultimate objective?

No ultimate objectives can actually be defined in terms of innovation. Each innovation sooner or later becomes outdated, only to be replaced by something new. The music cassette was replaced by the CD-ROM, and the introduction of MP3 players and online systems such as Spotify subsequently had a profound impact on the use of more conventional sound carriers.

By the same measure, we must always be critical of our current processes, objectives and technological options in order to determine which aspects require innovation. One thing that causes me concern is the rate at which existing innovations are being replaced by new ones. We find new innovations knocking at the door just as we have let the existing ones in. Where will it stop? And when will I miss the train? What happens when I miss the boat? Will I still be able to run fast enough to jump on board?

For now I am involved in our current processes, trying to establish connections with technological developments. In some cases I shall have to implement innovations as a means of 'running fast', which is of vital importance if we are to stay ahead and successfully deal with our competitors. My favourite professional pastime is to investigate developments that will push me to the top of the market!

"That's what I live for!"

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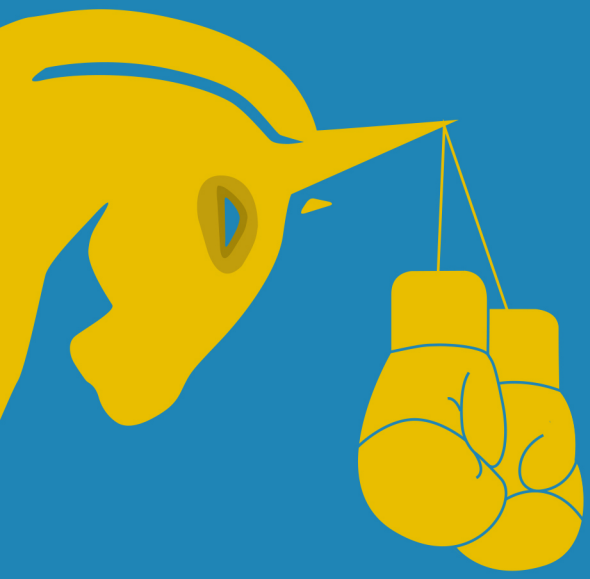
In Beat The Unicorn you'll find 13 stories about incredible adventures, straight-out failures and historic successes of corporate innovators that will inspire you to take up the glove and beat your unicorn.



No unicorns were harmed in the making of this book.