Farmers and Scientists

Thom Aussems

Introduction

My cradle stood in Kaatsheuvel. So that made me a boy of Brabant sand. Infertile land that required tremendous effort in order to stave off hunger. Where people worked together to earn a crust. That unmanageable sandy soil tested the character and inventiveness of the people who had to build their future on it. This also turned out to be the cornerstone for the success of the Eindhoven region that emerged from a remarkable transformation as an innovative High Tech region of global significance. More about this later. I believe that I can speak as an expert from experience. After all, I worked elsewhere for twenty years and I can assure you: things are done very differently there.

Today, Eindhoven is the engine that drives the Dutch economy. While less than two decades ago, the region had to endure Operation Centurion and the collapse of DAF, barely hanging on by its fingernails. No mean feat, so it is about time that we realised that this was not due to a relatively random series of historical events. I recently heard that an Erasmus University professor attending a symposium about the renaissance of the region Eindhoven labelled it as a 'fortunate coincidence'. Classic Randstad[i] arrogance and it most likely comes from the painful acknowledgement that true economic innovation will take place beyond the scope of Fort Holland instead of within its walls from now on.

But putting this to one side. Because coincidence or luck has nothing to do with the resurrection of the region. Nor did the *Marvel of Eindhoven* fall from the heavens through some miracle. No, the success of the region is far from the result of a miracle. It is the result of hard work and continuous smart building on the region's humus layer that has accumulated during the last 100 years. This humus layer, comprising a mixture of Brabant culture and creativity, plus a high-end manufacturing industry, R&D, engineering and design, has proven to be an excellent substrate for the successful transition of Eindhoven. It now makes the region the domain of farmers and scientists. A rich harvest from such miserable soil.

A transformation like this is certainly not a matter of course. Research by the Brookings Institute shows that in many places around the world this process takes place very slowly. Detroit in the USA is a sad example. Thirty years ago the city was known as *Motown*, the proud heart of soul and the American auto industry. Now Detroit is bankrupt. In comparison with back then, 2/3rd of the population have moved away. Who remains behind is left in poverty with little or few opportunities. But also elsewhere in the USA, in Wallonia, the Ruhr Area and the United Kingdom we see that very few regions with old industries manage to find a new way up. In this essay I will be analysing, based on literature and interviews, what economic transformation took place in Eindhoven and surroundings since Operation Centurion (October 1990) and the bankruptcy of DAF (April 1993) and what was the nature of the momentum that drove this transformation. That resulted in a region that we can typify today as a *milieu of innovation*, with the high-end manufacturing industry as its beating heart. In addition, I explore what is required to cherish and improve this ecosystem that has sprung from the region's humus layer. To secure the greatest capital of the Eindhoven region for the future.

1. The Humus Layer

The transformation of Eindhoven and surroundings could never have come about without the layer of humus developed from the beginning of the industrialisation. This layer of humus comprises competencies that originated from the Brabant culture and fostered the conditions for growth and blossoming.

Brabant culture

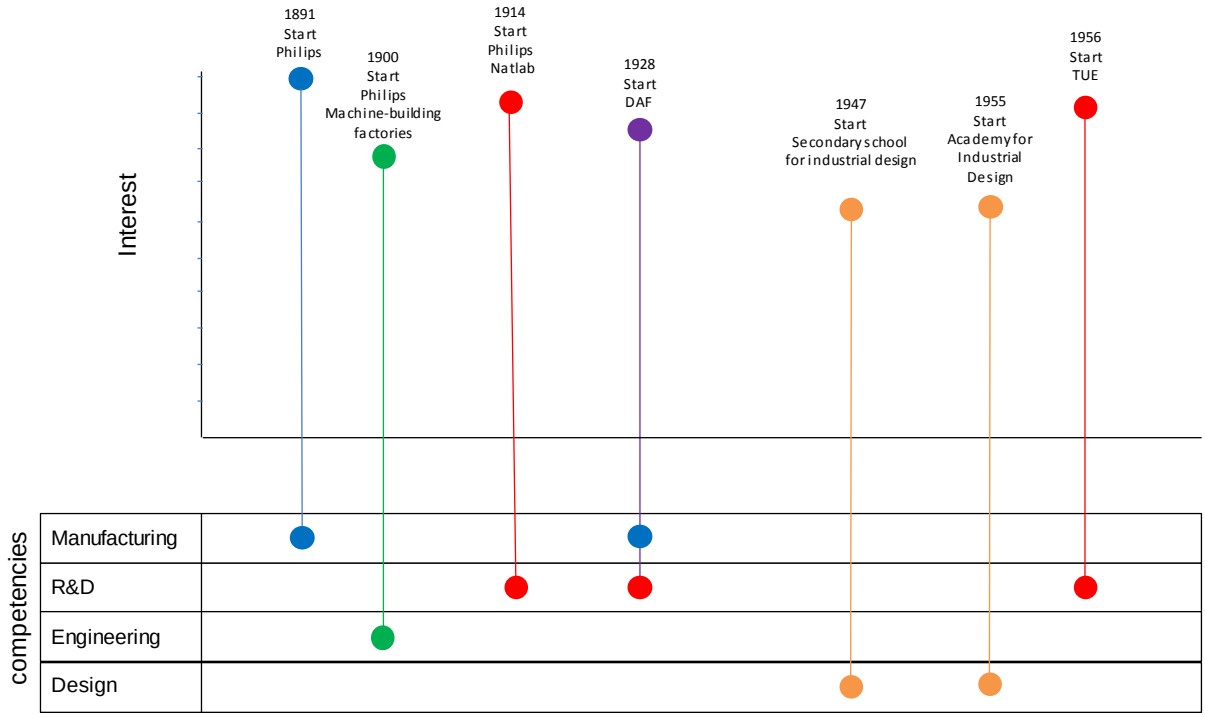
Brabant culture roots in daily life on the relatively infertile sandy soil from which nothing reaches maturity of its own accord. People from Brabant were workers, unpretentious people who were not spoiled by life. That demanded toil and pulling together. These characteristics gradually infiltrated the DNA. But the yearning for

independence, entrepreneurship at own risk and expense and trying out new things characterise the Brabant attitude to life. ‘We are thinkers and doers, not daydreamers', in the words of Aukje Kuijpers. Brabant folk are egalitarian. Henk de Wilt typifies Brabant culture as a flat horizontal pyramid, in contrast to the high vertical pyramid in Western Holland. In Brabant, people do not quickly get too big for their boots. Even the top of industry in Brabant, commonly family firms, usually consists of straightforward sensible people. Brabant people are not braggarts; you will not catch them blowing their own trumpet. ‘We cheer with our hands in our pockets’, as Harry Hendriks says. ‘No nonsense’ and ‘act normally and you’re showing off more than enough’ are certainly applicable to Brabant. This ambiance is an excellent substrate for fostering mutual trust, collaboration and not begrudging others a chance. Gerard Meulensteen: ‘When Wim van der Leegte succeeds, I’m as proud as he is’.

Competencies

The development of the strength of the Eindhoven region was of course a gradual success. With a number of benchmarks that afterwards appeared to have been crucial. Key figures in the industrial emergence of Eindhoven were Gerard Philips and Hub van Doorne, the founders of Philips and DAF respectively. These ‘big two’ had a decisive influence on the social and economic development of Eindhoven.

Figure 1: Key events and the relationship with the competencies in the humus layer



The trends above led to the Eindhoven region excelling in four competencies: manufacturing industry, R&D, engineering & design. In this chapter I will discuss the development of the competencies until the turning point at the beginning of the 1990s with Operation Centurion at Philips and the bankruptcy of DAF.

High-end manufacturing industry

The arrival of Philips in Eindhoven in 1891 was the starting shot for the manufacturing industry in the region. That Philips wanted to found its factory in the South of the Netherlands because of the low wages and the large families is clear. But Philips could just as easily have landed in Helmond or Breda, where the circumstances were very similar. That Eindhoven was chosen after all was partly due to the fact that the town already possessed an industrial appearance due to its many textile and cigar factories. The relationship the Philips family had with the cigar industry as a machine builder and the opportunity to purchase a factory in Eindhoven equipped with a steam boiler and engine settled the argument in favour of the City of Light to be. In the early decades Philips focused entirely on the manufacture and sale of incandescent bulbs. Later on, partly stimulated by research in the Natlab (physics laboratory which opened in 1914), the range of products and innovations grew steadily. Products that, in turn, became increasingly complex.

DAF, too, played an important role in the region's manufacturing industry. In 1928 Hub van Doorne established his own company, the 'Hub van Doorne, Machinefabriek en Reparatie-inrichting', later Van Doorne's Automobile Factory (DAF). Within DAF, Hub was in charge of all sorts of technical wonders, of which the famous variomatic gear box was the best known. When he retired in 1965, he had more than 100 patents to his name. Following the manufacture of trailers and cars, the focus at DAF shifted completely to trucks in 1997, after it had been bought by the American company Paccar. The company is still a major player in this market. More than a century ago, Philips and (to a lesser degree) DAF sowed the seeds in Eindhoven (what I perceive as the incubation time for the current *Brainport)* for the profile for a creative and innovative region that has raised manufacturing to an art form. A characteristic that is close to the identity and individuality of the area where historically words have always been followed with actions. And not necessarily in that order, borne out by Arjen de Koning: 'You have to do it with your hands first, before you can understand it in your head.'
Something else about the prominent position of the manufacturing industry in South East Brabant. In fact, the region set a trend that was and is atypical for the practices in this country. The Netherlands has always been driven by trade and the logistics stemming from this. There has always been a lot of snobbery about industry. Because factories stank, were noisy, dirty, grimy and stuffy and they polluted the environment. The idea of industry was almost automatically associated with the Nuisance Act. Even today, the inferior image of the business serves it an injustice. Despite the valiant efforts of the manufacturing industry to distance itself from this obstinate image. I have visited many industrial companies where the floors were cleaner than in a hospital. A region that has embraced the manufacturing industry meets, as a matter of course, obstinate prejudices in politics and government. I will return to this theme later in this essay.

Research & Development

The development of the discipline R&D in this region was started by Philips too, with the establishment of the Natlab in 1914. A typical example of private R&D, following the Henry Ford model. In the early years of modern industry there were more large companies just like Philips that organised R&D in laboratories that functioned as test beds for innovations and new products. At the time, the Natlab was considered one of the largest and most renowned R&D institutes in the world. Even Philips' competitors spoke in awe of this cradle of technology.
The Natlab was reputed to be a sort of 'superuniversity' where great freedom of thought abounded. In the glory years this paradise for researchers had 2400 members of staff on the payroll. This superior image seduced various top names from science to visit Eindhoven. Including Albert Einstein, the originator of the atomic bomb, who visited the Natlab in 1923. The public R&D in the region followed with the founding of the *Technische Hogeschool* in 1956 (now TU/e). This went anything but smoothly. There was concern among politicians and scientists that a 'Philips University' might evolve. Ultimately, the united lobby of Eindhoven and regional industry was too powerful for the competition from 's-Hertogenbosch, Maastricht, Arnhem and Enschede. Today, the TU/e (relatively small in scope, but with niche areas in which it delivers*)* is well-respected amongst experts. The institute regularly scores well in international ranking.

Engineering

By engineering we mean the design, manufacture and maintenance of machines and other hardware, systems, materials and processes. The start of engineering in Eindhoven and surroundings was most likely the founding of the Philips machine-building factories in 1900 where, in the course of the years, many advanced production lines were developed and made, for incandescent bulbs as well as screens. The Philips Centre for Manufacturing Technology (CFT) played an important role alongside the machine-building factory. Within the CFT, the principle of mechatronics was fleshed out that appears to be indicative for the region's current success (see chapter 2). In the 1980s the machine-building factories developed to become a production partner for mechatronic systems. Relationships with the current technology superpowers ASML and FEI date back to this time. In 2006 the Enabling Technologies Group, as the machine building factories are now known, were taken over by VDL.

Design

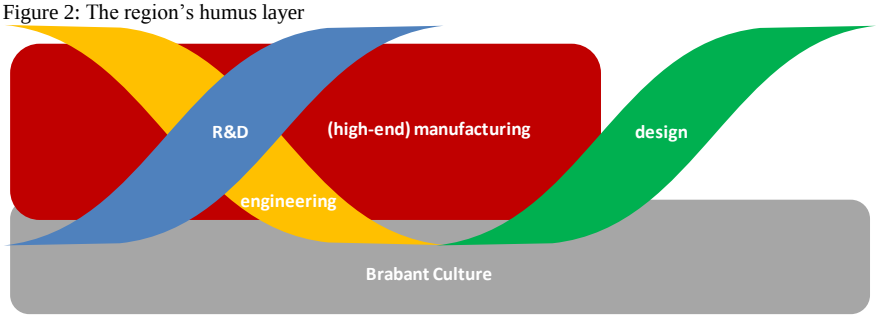
Just as was the case with the other competencies, Philips played a crucial role in the creation of design qualities in the region. In 1947 the *Middelbare kunstnijverheidsschool* (secondary school for industrial design) was established. Later, this acquired (with assistance from Philips) the label Academy for Industrial Design and after that it became the Design Academy Eindhoven (DAE). For almost sixty years, these courses ran fairly parallel with the design requirements within Philips. The history of Philips Design dates back to the 1920s. The

Philishave and the compact cassette are two of the most famous designs from the long history of this part of the company.

Conclusion

With Brabant culture as a substrate under the humus layer four competencies developed in the Eindhoven region: high-end manufacturing industry, research & development, engineering and design. They laid strong foundations for the region and this was decisive for the unfolding of the economic future. It is striking just how interwoven R&D and engineering are with the competencies of the high-end manufacturing industry. Design only played a limited role here, because the global niche players in the region (like ASML & FEI and their thousands of suppliers) are not active in the consumer market, but focus primarily on business-to-business. This market does not usually make the same high demands of design. A printed circuit board or switch box has to be functional and does not need to look fancy or contemporary. This restriction does, however, apply to a smart phone, tablet or LCD TV.

Figure 2: The region's humus layer

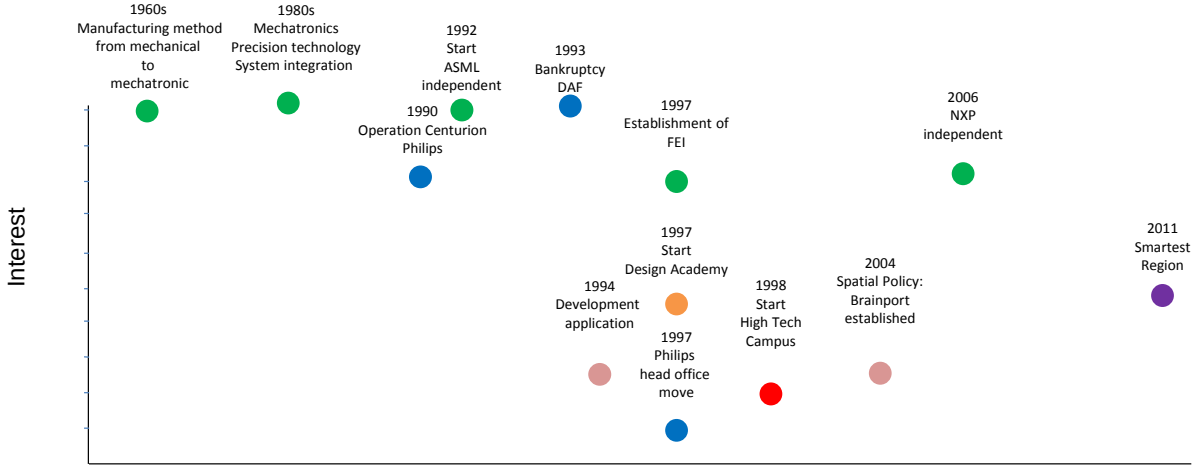


2. The Transformation

Eindhoven's turn-around from a stereotypical industrial city to the current economic ecosystem took place in the wake of Operation Centurion at Philips and the fall of DAF. They were tough times. How close the shave was that Philips underwent only became clear later. Without Operation Centurion (1990), the largest reorganisation in the company's history, Philips would probably not have survived. But the price that was paid was draconic: 40,000 employees, of which 10,000 in the Netherlands were sacked. In Eindhoven especially, the traditional home base for the company, hard blows were felt.
This did not bring the adversity to a conclusion. Hot on its heels, in 1993, the region had to cope with another serious blow, being the bankruptcy of DAF. More than half of the truck builders, 5000 employees, lost their jobs, the other half were able to return to the pared-down DAF that remained after the restart. Because there was no money for redundancy payment, there was widespread social misery. From a psychological point of view, DAF's throes of death were experienced by many in the region as even harder blows than the ups and downs at Philips. The region's picture of the world was shattered. The 'from cradle to grave' culture, the protected environment, the feeling of being part of one big safe DAF - or Philips - family, from one day to the next, it all collapsed under the pressure of the changing economic mores. I will come back to the fact that this coin had a flipside later.
This last aspect does not mean I want to make light of the fact that the region had to make great sacrifices to get a transition moving of which at the time no one could envisage the implications. Especially because Operation Centurion and the bankruptcy of DAF were not just a drama for the employees of the individual companies. Countless suppliers also paid a high price. Or in the words of Hans Duisters: 'When Philips caught a cold, the suppliers got the flu, a large number of them even died as a result'. Which is why we should never lose sight of the fact that the transformation of Eindhoven was no luxury, but a bitter necessity for survival. This went hand in hand with a lot of blood, sweat and tears and left deep scars.

The figure below shows the important turning points in the transformation process.

Figure 3: Turning points in the transformation of Eindhoven and surroundings



If we look at the transformation, we see various movements herald this transformation in the course of time.

1 From mechanical to mechatronic

An important origin of the transformation of Eindhoven and surroundings dates back to the 1960s, when Philips changed its CFT manufacturing method under the auspices of Wim van de Hoek. The mechanical main axel that powered the production lines was replaced with electromotors. Mechanical became mechatronic. This facilitated not only more accurate, but also more rapid manufacturing. This move gave the blossoming of mechatronic competency in the region's humus layer an enormous push. The importance of this decision can hardly be underestimated. On reflection, we can say that this was when the embryonic phase of High Tech Systems made its debut.

2 From vertical integration to a horizontal network

Philips was typically a company that had historically been organised vertically. The motto from the beginning was everything in-house. To gain control over the raw materials and the entire production process, suppliers were made dependent on the company and subsequently purchased. This led to their own glass works, corrugated cardboard plant, machine building and Philite factories. Even the toilet seats were made in-house, or so I am told. This vertical integration was characteristic of the major multinationals like Philips, but it made the company complex, vulnerable, sluggish and poorly organised. Or as Cor Boonstra once said: 'Philips had become like spaghetti'. Bureaucracy was the order of the day. With as a result the company increasingly lagging behind the Asian tigers and losing its decisiveness. In addition, the company culture at Philips was patronising, which dampened the entrepreneurial spirits. The atmosphere that dominated in and out of the factories at the time was perhaps best expressed in the complacent company slogan in use at the time: *Philips, then it is good.*
In the seventies it seemed that the increasing international competition was gnawing at the roots of these apparently impregnable bastions. For the large vertically organised companies there was little choice but to become 'lean and mean' and to focus on their core activities. Everything that fell beyond this had to go. This happened at Philips too. It led to the closure and sale of business units and spin-offs. From this, new giants would arise like ASML, FEI and NXP. An important effect of this is that 'the two big lads' in the region became far less dominant. But this was not restricted to Philips, the suppliers also underwent a turnaround. They were given a completely different role, from now on they had to collaborate and assist development.
With the result that suppliers now, in addition to manufacturing, are also involved in engineering, prototyping and system integration, through which they take on more responsibility for a larger proportion of the High Tech chain. This allows their customer to focus more and more on the development of the latest technologies and applications (R&D) and customer relations for selling the products. But the suppliers took advantage of yet another development. Because they were no longer operating under the wing of Philips, they came into contact with other market parties and customers. This strengthened their commercial position and autonomy and meant that they spent more time and energy on marketing.
This approach to work created a horizontal network, in which many parties worked closely together. This also led to a tremendous number of new players in the manufacturing industry, like SoLayTec, Mutracx, Comaxx, WESP/PSV Carbon, Sioux, Assembléon, Sapiens Steering Brain Stimulation, BioArt Laboratories, Innovalens, Civolution, Van Berlo, FreeSense Solutions, Laméco, Nemo Healthcare, CMNTY, Prodrive, Phoenix 3D

Metaal, InnoSportLab, Shapeways, Genexis, Miortech, Liquavista, IRX Innovations, Medical Robotic Technologies, Phenom World, Intel Benelux and Additive Industries.

3 From concentration to distribution of expertise

In Operation Centurion, one in seven employees within each Philips business unit got their marching orders. Irrespective of whether or not the results were in the red or black. Among them were many thousands of highly educated and qualified people. This flooded the labour market with an enormous selection of expertise that the suppliers were crying out for at the time. Jan van Gemert from Gemco Industries about this: 'The difficult period at Philips had benefits for the companies in the region too. Excellent people became available for our size of companies, which resulted in an upgrading of the knowledge and capabilities. There came a point where we had five extremely competent former Philips managers working for us. You only had to watch that they didn't spend too much time together or they reverted to type.'

4 From broad technological knowhow to global niche players

Where Jan Timmer saved Philips' skin with Operation Centurion, his successor Kleisterlee (2001-2011) provided focus in the company's products. Thanks to the innovative research in the Natlab, the range of products had grown and widened exponentially since the start with the incandescent bulb. Lighting, music, radios, televisions, medical equipment, domestic appliances, telecommunication, pharmaceutical and chemical products – really, were there any areas in which Philips had not been active? From the chaos of activities Kleisterlee selected Lighting, Healthcare and Consumer Lifestyle. This transformed Philips into a global niche player. Philips spin-offs ASML and FEI follow a comparable strategy. They too are global niche players with their exceptionally precise and complicated machines and high-end equipment. It is worthy of note that this is one of the unique selling points of the Eindhoven region.
Industry here disposes of the rare capacity for the manufacture of the most complex machines. This is highly advanced and refined system integration. Thousands of suppliers are involved with the renowned ASML wafer stepper. With a more or less superlative degree of cooperation they all take ownership of a single link in the chain. Even the smallest screw is state of the art and is subjected to minute specifications. There are very few places on earth where something of this level can be achieved.

5 From mechatronic to precision technology and system integration

In the 1980s mechatronics really took flight within Philips. The change came when machines were required that could only be achieved through the bundling of the disciplines mechanical engineering and (through the digitalisation of electronics that was underway) information technology. Because Philips managed to get its specialists from these different disciplines to work closely together, it was successful in the development and building of these extremely complicated and accurate machines and equipment. This ultimately led to the development of precision technology and system integration. Competencies with which the region shows off around the world today.

6 From separate worlds to cooperation

Following the double knock-out of Operation Centurion and the bankruptcy of DAF came the realisation that people needed each other. More cooperation took place between companies and between companies and knowledge institutes. The conviction that industry, government and knowledge institutes were also obligated to form a united front to get the regional economy back on its feet was widely acknowledged. This cooperation, known by the name Triple Helix, first took shape within Stimulus and Horizon, grant programmes that were focused on economic structure reinforcement. Following the recognition of South East Brabant as one of the cornerstones of the Dutch economy, through its labelling as Brainport in 2004, the Triple Helix focused on the realisation of the integral agenda from the '*Brainport Navigator, Lissabon Voorbij!*' with four activities in four areas: People, Technology, Business and Basics. Since 2009 the compass has been set for the programme Brainport 2020. The ambition is that Brainport will then fulfil a top-3 position in Europe and a top-10 position in the world as a top technology region.

7 From forbidden city to open innovation

The reticence of Philips in the past was perhaps most visible in Strijp S. The forbidden city, heavily guarded behind a high fence. Where employees had to eat their lunch inside the gates, and where no one except for Philips personnel were permitted. The innovation in the Natlab, however perfect, was likewise completely

introverted, protected as far as was possible from the outside world. How different that is now. The realisation is now very much alive that companies actually need each other and knowledge institutes, that they need to get together to be able to take innovation to the next step. A clear example of this is that Peter Wennink from ASML indicates that he expects his first-line suppliers to develop in step, due to the enormous complexity of the products and to keep the chain manageable.
The movement towards open innovation has resulted in the arrival of more knowledge institutes, like TNO and the Holst Center. This turnaround to open innovation is most visible on the High Tech Campus, the *dolce vita* for nerds and boffins on the banks of the river Dommel where innovations are worked on diligently, where R&D facilities and knowledge are shared, cross-pollination takes place and unexpected connections are made. High Tech companies like Philips Research, Philips Innovation Services, NXP, Dalsa, Atos, FluXXion and Cytocentrics have nestled themselves on the campus. As well as technology institutes like the Holst Center and EIT ICT. The High Tech Campus is a global village where, without accreditation or the hindrance of barriers, you can walk onto the terrain.
The region is already the leader with regard to private R&D in the Netherlands. Philips and ASML hold positions 1 and 2 in the Top 30 company R&D, DAF is at 9, VDL at 13. If you are wondering which region in the world has the highest patents density, look no further than Eindhoven and surroundings. The number of patents per 10,000 residents is 22.58. As a comparison: San Diego in the USA holds second place with 8.95. The most important patent applicants are Philips, NXP and ASML. Together they represent 95.4 percent of the total number of applications.

8 From Rhineland model to American Brabant style

However big, in spirit and nature Philips was a company with a touch of the family firm. There had been many more of this type of company in the Eindhoven region in the past. But in the last decades the number of stock-listed companies has increased dramatically. As a result, more Anglo-Saxon influences are felt in what was originally a region with a more Rhineland economic model. This has meant that long-term results have had to make space for short-term ones and profits. The region has learned how to be sharper, more business-like. Just like American commerce, it has modelled itself to the discipline of the market. But the Anglo-Saxon tint also creates tension. For example, in an interview a manager expressed his preference for doing business with regional suppliers and he was castigated by the American manager of the company for, 'not knowing what was for sale in the world'. I am increasingly convinced that the region now has its own unique mixture of Anglo-Saxon and Rhineland traditions, the best of both worlds. The roots in the sandy soil, such as the drive for collaboration, the non-begrudging nature, the scope fixed on far horizons, cross-pollinated with the typical Anglo-Saxon characteristics such as mindful of yield and shareholder value.

9 From company town to Supervillage

Although, at the time, many considered the Philips head office moving to Amsterdam in 1997 to be a major drain for the region, in retrospect just as many see this differently. Henk de Wilt called the head office move a 'blessing for the city'. After all, it meant the end of the - although well-meaning - paternalism of Philips. For more than a century, Philips had been omnipresent in Eindhoven, not just in the economy, but also deeply rooted socially and in the recreational life in Eindhoven. Philips built houses for its workers (in Philipsdorp and Drents Dorp), and there were Philips schools, a Philips library, a Philips social centre and a Philips Sport Association (PSV), etc. Peter Wennink from ASML: 'Philips was a mini-welfare state'. With the departure of the head office, 'the blanket was whipped away', according to Henk de Wilt. The end of the paternalism also literally meant more space for entrepreneurism. Eindhoven can now be described as a Supervillage: a comfortable region of which the strength lies in the paradoxical combination of a slow, rural home base and a rapid generic network. Simply: in a small-scale village-like city network, where everyone knows each other.

10 From Kalff to Dutch Design Week

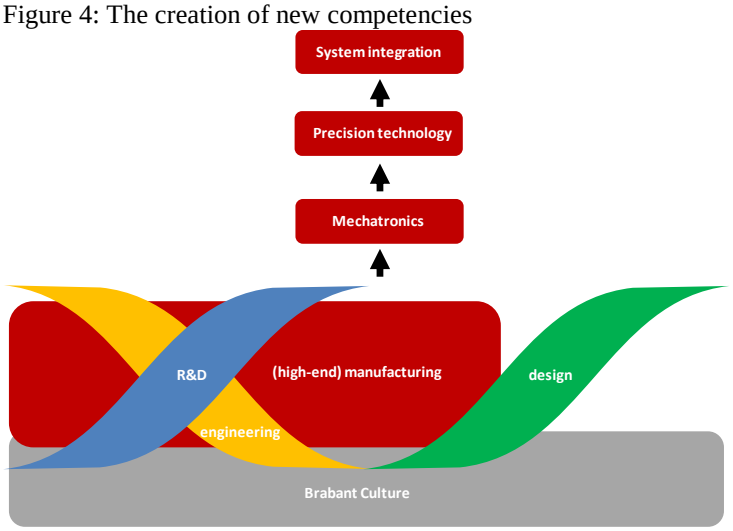
Historically, the education with the Academy for Industrial Design Eindhoven (AIVE) was chiefly focused on the design tasks required within Philips. The man responsible for this at the time was Louis Kalff, who was sometimes characterised as the 'artistic conscience of Philips'. This is what we call applied arts. After the change of name from the AIVE to Design Academy Eindhoven (DAE) in 1997, something changed. In addition to applied design (an agency like Van Berlo is a good example), a major autonomous design movement steadily grew within Eindhoven (people like Kiki and Joost and Piet Hein Eek). In the meantime, the DAE has educated many of the big names in the design world.
In the course of the years the Design Academy *('The school of cool'* as the academy was once described in the New York Times) has acquired an internationally renowned reputation. In 2005 the British design magazine

ICON put the Design Academy Eindhoven at number five on its list of most influential people, products and institutes in the world of design. Eindhoven is generally considered as design city, which is more than clear from the success of the Dutch Design Week, which has grown to become an international event. In the area of applied design the TU/e opened the faculty of Industrial Design in 2001.
Where with applied design there is a clear integration with the manufacturing industry, for autonomous design this is certainly not so. Autonomous design is, however, very important for the region's creative cultural climate and image. It has developed in the shadow of the existing economic ecosystem to become a mature cast iron brand. This is most visible during DDW, where two thousand designers attend to exhibit and demonstrate their new ideas, concepts and prototypes.

11 From a sleepy and boring provincial town to the smartest city

Eindhoven is gradually shedding its sleepy and boring provincial city image. The labelling of the region as Brainport has been significant, but the award in 2011, designating it as the smartest region in the world, has been a major contribution. That such exceptional things are taking place in Eindhoven and surroundings, not just on a technological level but also on a creative one, is starting to attract attention. This was reason enough for a number of parties to organise the event 'The Marvel of Eindhoven' in Amsterdam in February 2013.

Figure 4: The creation of new competencies



This diagram clearly depicts the direct line that runs between the competencies of the Eindhoven region and Brabant culture. Industry in South East Brabant is able to integrate the most complex machines, services, systems and processes. This is perhaps the real secret behind the economic success of Eindhoven and surroundings. The complexity is only achievable if the parties within the networks are on equal footing with each other and together support the superlative cooperation. Because if a single link or component in the process is not right, the entire chain is worthless. It is at exactly this point that the farmers and scientists in the title of this essay come together. The farmers symbolise the Brabant culture of cooperation, the scientists the system integration in which the Eindhoven region excels.

3. The Tricks of the Trade

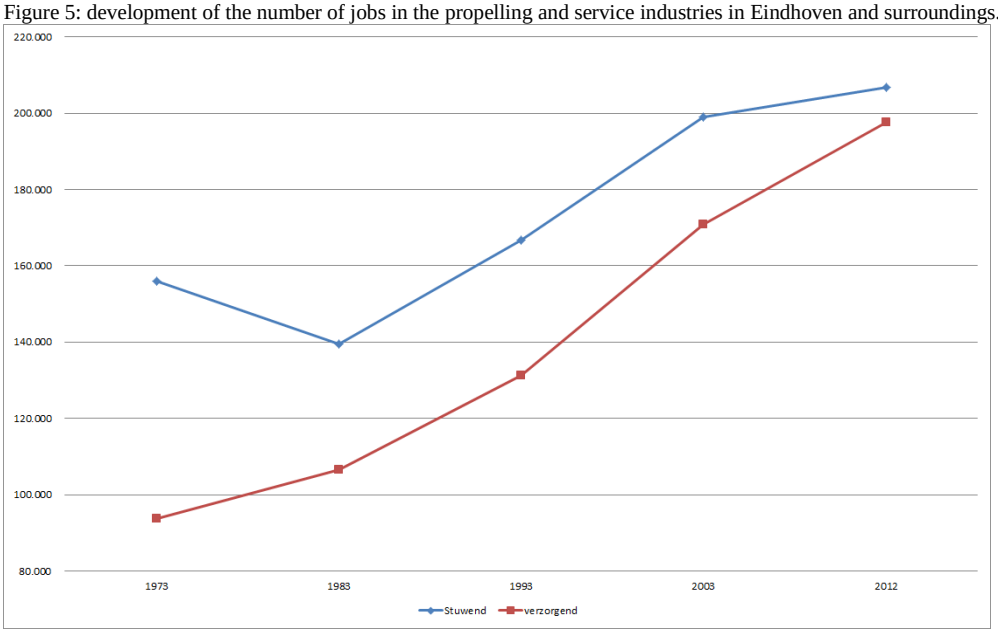
If we examine the economic profile of the Eindhoven region under a magnifying glass, what do we see? What has the transformation described in the previous chapter led to in quantitative and qualitative terms?

The structure of the regional economy

Global is dominant
The Brainport region makes a considerable contribution to the gross national product. After the Amsterdam region, it is the second regional economy in our country. But the question remains: who makes which contribution? At my request, Bureau Louter investigated what proportion of the employment (1) was with export-oriented companies (part of the global new network economy) and (2) what with the companies serving the region (so-called domestic economics) (* note: the statistics concern the distinction between propelling and

regional serving). This provided the first surprising result. Because it is not just that global players are the biggest employers, but we see a very rapid increase from 1973 onwards. An increase that seems to be at odds with the general consensus about the economy: it was of course always better 'in the past' and industry is doomed. The opposite is true: the concerted efforts of ASML, FEI, DAF, VDL, Philips and all the suppliers involved generate substantially more work than Philips did at its pinnacle in '73.

Figure 5: development of the number of jobs in the propelling and service industries in Eindhoven and surroundings.

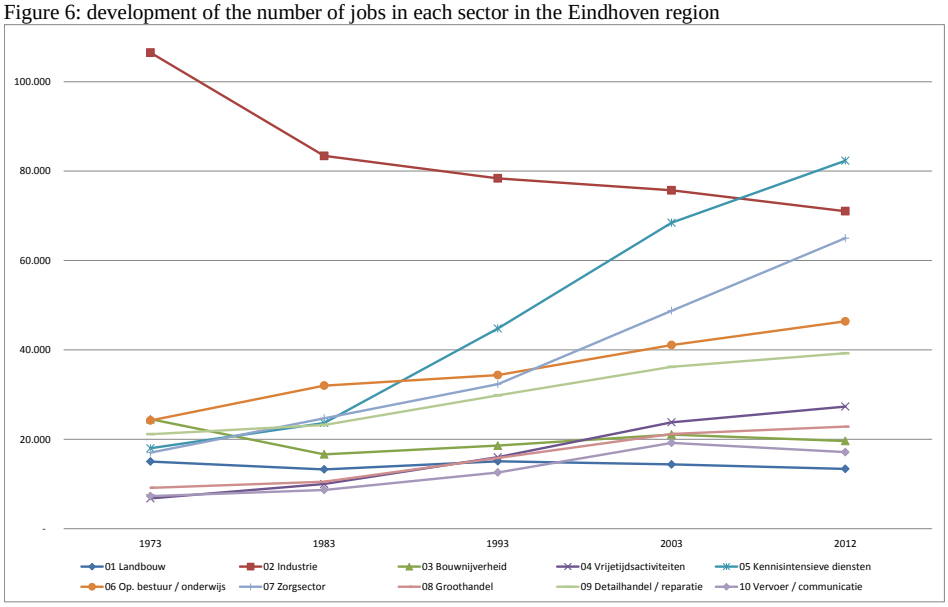


Statistics: Bureau Louter & LISA (2012)

Industry and knowledge-intensive services are the engines for the regional economy

When I dissect the figures further, see graph 6, it is striking that the number of jobs in industry have decreased in the last decades, but with 70,000 jobs, of which 53,000 in High Tech industries, it is still the top scorer in the region. There is also an enormous increase in the number of jobs in knowledge-intensive services from 18,000 in 1973 to 82,000 in 2012. Knowledge-intensive services that are chiefly linked to the high-end manufacturing industry. It is a trend that greatly benefits both these industries in the region. Companies increasingly do more than just supply the equipment. In close and permanent consultation with the customer they also look after the implementation in business processes, the technical management and maintenance. In the USA, for example, Philips Medical Systems and Philips Lighting have adopted this approach.

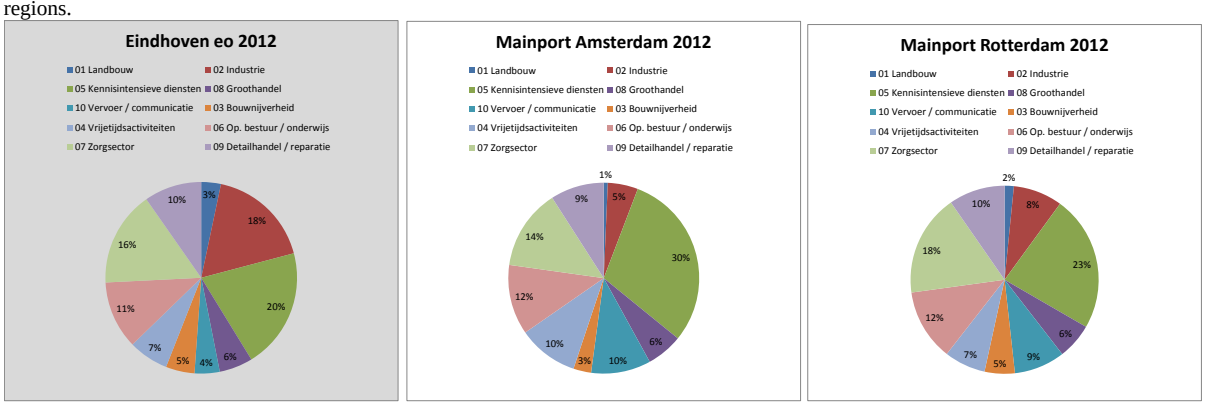
Figure 6: development of the number of jobs in each sector in the Eindhoven region



Statistics: bureau Louter & LISA (2012)

Differences compared to Amsterdam and Rotterdam
The Eindhoven region distinguishes itself from the other Mainports in the Netherlands in the scope of the importance of industry for society (see fig. 7). Where industry in Eindhoven and surroundings still provides about 18% of all the jobs, in the Mainport Amsterdam that is but 5% and in the Mainport Rotterdam only 8%.

Figure 7: breakdown of the Eindhoven and surroundings economy into sectors in comparison with that of the Amsterdam and Rotterdam regions.



Statistics: Bureau Louter

There are strong indicators that the economy in Eindhoven and surroundings has developed in the direction of the *German Industrial Production Model* and the regions of Amsterdam and Rotterdam are leaning towards the Anglo-Saxon *Service Economy Model*. Indeed, it has been acknowledged for some time that industries involved in high-tech systems are early cyclical, but at the same time it appears that the 'German' model is more stable than the Anglo-Saxon one. A good illustration of this is 2011, the year in which the Dutch economy as a whole suffered a deep crisis, but companies like ASML, FEI, NXP and others experienced a top year.

The secret of the multiplier
Due to an absence of home-grown research I stray abroad for advice on this point. A study for the *President's Council of Advisors on Science and Technology* shows that in the USA, of all the sectors, industry has the highest multiplier. According to this research, every job in industry generates 2.5 jobs in other sectors. Research by Moretti in the USA shows that every job in High Tech even leads to five jobs in other sectors: two for highly educated professionals like lawyers and physicians and three for people with low education like waiters and shop assistants. The creation of jobs in High Tech appears to be an extremely effective way to tackle unemployment.

Another recent report from the USA shows that industry lays a far more robust and sustainable cornerstone under the economy than can be derived from the GNP. In the USA the contribution to the GNP is 11%. But simultaneously this industry is responsible for 70% of R&D, 90% of all patents and more than half the income on the trade balance. An invisible, but undeniable superpower, this industry. No wonder that the 'renaissance of the industry' is currently one of the Obama administration's most important strategic themes.

The importance of the high-end manufacturing industry for the Eindhoven region cannot be stressed enough.

Milieu of innovation

Concentration of manufacturing in metropolitan regions
We live in the age of the *New Economy* that runs on knowledge, innovation, globalisation and networking. The inventor of the term is Manuel Castells who, in his book *The Rise of the Network Society*, paints the contours of this far-reaching transition. With the arrival of the world-wide web, time and place no longer mattered, thought scientists, entrepreneurs, experts, trend watchers and opinion leaders in the rise of the digital revolution. It was expected that the electronic highway and the virtual world would lead to the death of distance and the death of cities, according to Cairncross (1997) and Glider (1995) respectively. I can remembered an advertising film from the time in which the CEO for a major US company was fleshing out his corporate strategy on a computer, sitting at the edge of a cliff in the Rocky Mountains. Who on earth would want to while away their hours in an anonymous office building if you could do the same work in the garden, at the seaside or on your laptop in the mountains?

Strikingly enough, from an economic perspective, the opposite occurred. In the first place, scientists noticed that a new form of urbanisation took place in the new economy, being the forming of metropolitan regions, like the Pearl River Delta. Such a region comprises multiple cities, with varying relationships. We also see in an area like

this a decentralisation of residential demographics, activities and services with mixed land use and a difficult to define territorial border that ends where the networks stop.
Subsequently, we can conclude that in 2013 the economic activities are to an increasing degree concentrated in the metropolitan regions. Porter describes this phenomenon as the global/local paradox. According to McKinsey, the metropolitan regions with 38% of the world population produce 72% of the GDP.

Getting together has added value
But why is it that the economic activities congregate in the newly formed urban areas? I would like to propose two explanations. Firstly, the concentration is explained by the proximity. Cites are so important for economics and innovation because companies benefit from mutual proximity. And this does not just rest on geographical position and distance, but it also has an institutional and social dimension. So, as we saw previously, the arrival of the Internet and the information society ensures that digital knowledge can be transferred and shared when and where you want. But apart from this codified knowledge there is also something known as tacit knowledge. This is the often invisible knowledge inside people's heads that is an inherent part of their personality and wanders around within the informal routines of organisations. Face-to-face contact is essential for the exchange of this knowledge. Eindhoven = Supervillage: organised, close-by and relatively modest in size. In other words: geographical proximity, i.e. something strange has to happen for you to miss each other.
In addition to geographical proximity, according to Fu, Schiller & Diez, social proximity is of great importance too. Mutual trust must exist among actors and there has to be a feeling of reciprocity (Guanxi). This requires meeting people, human contact and short lines. We see in Eindhoven and surroundings that such conditions have grown to become key qualities. Working together, granting each other opportunities, the attitude of not wanting to try and organise everything on your own, mutual trust, we have it all. Thanks to the sandy soil. But you can sit up as close as you like, elementary networks (institutional proximity) are required to cash in on the benefits of proximity. Both formally and informally. Eindhoven is fully equipped for this. There are countless platforms in the city and region where CEOs regularly meet up. 'If I temporarily have twenty engineers spare, I only need to wander into one of my networks and I can place my employees within another company', an entrepreneur recently related to me. Many people in that network originate from the Philips stable and have known each other for a long time. From this mixture of factors, a strong network structure has grown within the region, which is the envy of the world beyond. Of course, many of these entrepreneurs are competitors. But at the same time these networks have a strong degree of collegiality and amiability. These are characteristics deeply rooted in the region's DNA and they reflect the Brabant culture and the way in which we do business here.

Gleaser provides a second explanation for the renewed vitality of the major cities and the concentration of economic activities in metropolitan regions in *'The Triumph of the city'.* For this, he employs the paradox introduced by the 19th-century economist Jevons. This is known as *Jevons Complementarity Corollary*. Jevons explained that with the arrival and more efficient use of the steam engine demand for coal did not fall, but actually increased. Gleaser projects this theory onto the *New Economy* and states that the improvement of networks, faster internet and the increasing ease with which information can be transmitted around the world, have actually led to more and not less person-to-person contact. The importance of this has actually increased. 'Statistical evidence also suggests that electronic interactions and face-to-face interactions support one another; in the language of economics, they're complements rather than substitutes.'

Is the Eindhoven region (part of) a metropolitan region?
But where are the metropolitan regions in Europe? Which areas are we talking about?

Table 1: comparison of eight European metropolitan regions

Metropolitan regions	Surface area km2	Number of residents 2000/2001	Shifts in number of residents (%) in period 1990/1991 – 2000/2001	Employment opportunities 2000/2001	Shifts in employment opportunities (%) in period 1990/1991 – 2000/2001	Number of FURs
South East England	29,184	18,984,298	+13.5	9,040,000	+32.9	51
Randstad	8,757	8,575,712	+7.1	4,031,900	+29.0	25
Central Belgium	16,000	7,800,000	+2.6	3,320,000	+10.0	8
Rhine Ruhr	11,536	11,700,000	+1.1	5,400,000	+3.4	47
Rhine Main	8,211	4,200,000	+5.7	1,695,000	+1.7	6
EMR Northern Switzerland	13,700	3,500,000	+7.6	2,200,000	+6.7	8
Paris Region	43,019	15,691,730	+2.9	7,660,880	+3.2	30
Greater Dublin	7,814	1,637,267	+9.3	798,515	+62.9	1

Regions	Surface area km2	Number of residents 2012	Employment opportunities 2011 / 2012	Number of FURs
Eindhoven and surroundings (SRE)	1,457	744,983	404,350	2
ELAT	14,269	5,900,000	2,900,000	??
Brabant(cities)	4,914	2,463,686	1,246,294	5

You do not need to be a scholar to see from the statistics above that the Eindhoven region does not meet the criteria of a metropolitan region. Neither is it a part of a larger metropolitan area. The law of averages does not apply to Eindhoven and surroundings with its 745 thousand residents. The region does not have sufficient mass and misses the agglomerative attraction that other metropolitan regions in Europe enjoy. In all sorts of statements and overviews, the Eindhoven region is stuck around the 20th position with regard to economic revenues. This is due to the relatively modest size of the region. With its 745 thousand residents it is no match for regions like Paris, London and the Ruhr Area. However, if we just look at the economic contribution per resident, it might well be the highest in Europe.

A strategy for making a stand in this area is known as 'borrowed size': hitching a ride with the strength and potential of close neighbours, where excellent connections are crucial. The question, however, is, does this approach offer any consolation for the Eindhoven region? During the last decade the region has laid irons in the fire here and there to alleviate this shortcoming. From within Brainport, for example, the importance of the Eindhoven Louvain Aachen Triangle (ELAT) is emphasised. ELAT appears to be a logical line of march, because the companies and knowledge institutes situated in the region appear to be well-matched from a technological point of view. The connections between the cities are, however, mediocre. Above all, ELAT is not or hardly noticeable for the people and industry in the region.
Is upgrading to Brabant or Brabant City an option? Many people would like to see Brainport, due to its strong brand and globally appealing profile, scaled up to the level of Brabant. The necessary good infrastructure is in place, but with regard to the type of industry and knowledge institutes there is very little cohesion between what is taking place around Eindhoven and in the other regions in the rest of the province. Above all, there are a considerable number of governmental and political sensitivities that stand in the way of a Brabant without regional borders. In brief, 'borrowed size' does not appear to be a universal remedy for the Eindhoven region.

Milieus of innovation
The last thirty years have shown that certain specialised small-scale regions have managed to thrive on the world stage. There are good examples of this on various continents, with Silicon Valley in the lead. Regions like this stand out, because they dispose of an extremely successful 'milieu of innovation', according to Castells' analysis. A relevant question is: do Eindhoven and surroundings belong on this same stage? Does the milieu of innovation mean that the region disposes of sufficient qualities and characteristics to be able to measure up to the best?

There are all sorts of milieus of innovation and they occur in different areas; cultural, financial, criminal, scientific and technological. Within the scope of the transformation of the Eindhoven region we are especially interested in the way in which technology milieus occur. In connection with this, Castells employs two terms:

‘milieu of innovation’ and ‘technopolis’. The term milieu of innovation originated with *Groupe de Recherche Europeen sur les Milieux Innovateur* (GREMI) from prof. Aydalot. The basic idea behind this is that the functioning of companies cannot be considered separately from the environment in which they are to be found. An environment with a specific identity that acts as a flywheel for generating its own innovative companies. According to the aforementioned definition the most important elements in the milieu of innovation are:

- cooperation and the exchange of information between regional actors;
- lots of face-to-face contact;
- commitment of the actors from the different branches of the economy (companies, knowledge institutes and government);
- awareness of the actors that they are part of a coherent unit and regional culture.

In brief: an almost organic combination of social, institutional and geographical proximity is *conditio sine qua non* for achieving a milieu of innovation.

The key question is: does the Eindhoven and surroundings’ regional economy meet these criteria? For the answer to this question we must return to the shifts that took place in the regional economy from 1970/1973 onwards. Especially the strategic decision that Philips took to effect vertical disintegration is essential here. Up until this point, Philips had organised almost all the links in the chain in-house and as a result was not dependent on regionally supporting systems from suppliers. Innovation, too, was entirely anchored within the company. The consequences of the vertical disintegration of Philips were not just the closure and independence of business units, but also to an increasing degree the cooperation with suppliers in the region. Not solely in manufacturing but especially in the field of innovation. Cooperation in the chain was also at the forefront among the new conglomerates, with ASML as the uncontested leader. This created horizontal networks. These networks do not solely comprise companies, but also other supporting regional parties, such as specialised services. There is also institutional support from universities, research institutes and government. A climate of trust and begrudging each other nothing are crucial for properly functioning and horizontal networks. And these just happen to be the ingredients that give the economic ecosystem in Eindhoven its flavour. The conditions for maintaining its position in the competitive battle over other regions are in plentiful supply in the land of Farmers and Scientists. The ecosystem surrounding the high-end manufacturing industry, with mechatronics, precision technology and the capacity for system integration as a distinguishing competency, can safely be called globally unique.

Additionally, in the last decade, a creative humus layer has developed. Interestingly, this is increasingly manifesting itself along the border between technology on one side and art, design and light on the other. The Dutch Design Week (DDW) began as the Design Day, but grew to become an event where designers present all the more autonomous ideas, but also experimental prototypes that appear to have a certain interrelation with technology. *Glow* (light and technology) and *STRP* (art and technology) employ a comparable formula in their own specific areas. To my mind, a weakness of the region is that there are too few *DDW*s, *Glow*s and *STRP*s, through which insufficient mutual expansion occurs. Both bohemians and nerds walk among us, for the reinforcement of the Eindhoven and surroundings’ milieu of innovation it would be good if they collided more often. Because it is precisely where the different disciplines abrade each other that exciting innovation hatches.

The effect of all the movement in the Eindhoven region is that a milieu of innovation was born. This is the significant transformation that has taken place during the last two decades: from an industrial city to a milieu of innovation.

4. The Game of Changing

In this last chapter, two topics take centre stage. First of all: what do we need to do to maintain the current ecosystem, so that we stay ahead of the competition in the race? Can such a system actually be created, and is this something worth striving for? The second question is to what extent the quality of life in the Eindhoven region can contribute to the further economic blossoming of the area. Which parties come into play here, and under whose auspices should this fall? On the basis of my interviews and analysis of the region I have arrived at a number of insights and recommendations.

Reinforcing the Ecosystem

1. Cooperative planning, cooperative action

The very first recommendation is that we need to permanently reserve time for considering together the ecosystem, with its corresponding strengths and weaknesses, on different stages and in different complements. Brainport Industries is already involved in this. This organisation's activities are focused on themes that are relevant for the ecosystem. But fixed delineated plans, scenarios and blue prints must be avoided, because they can have a boomerang or constricting effect. Because what makes Eindhoven and surroundings so valuable and unique today, would never have occurred to the main actors from the Operation Centurion and DAF period, nor would they have been able to foresee or steer it. The inception of this ecosystem cannot be seen separately from the specific Brabant culture and the identity of the sandy soil. Let us continue to cheer with our hands in our pockets. Let us be wary of arrogance and boasting. It is inherent to our DNA, it makes us strong.
Thinking in terms of manipulability is a tricky business. Examples from the past (and not insignificant ones) have shown that such exercises are almost always overtaken by reality. Even so, we should not be frightened of new ideas that could reinforce the foundations of the ecosystem and the milieu of innovation. But they should be able to be named as game changers. This means that, on the basis of the existing competencies and capacities, innovation is sought that can contribute some form of value to the Eindhoven and surroundings' ecosystem. Such game changers should be multidisciplinary, integral, holistic and pioneering. And as such ensure that we do not doze off or start to live off our reputation that is sooner or later doomed to evaporate. Game changing places great demands on the region's ability to adapt: ideas have to be developed and transformed into products that are, in turn, taken to market. And all this at the desired speed. It is to be expected that entrepreneurs will lead and that the knowledge institutes, government and financers will feed this process.

2. Soft values

System integration is the region's key competency and this capacity is tightly woven in the Brabant culture in the region and the characteristics that this embodies. With keywords like trust, hard work, reliability, joint ventures, ability for sharing, confidence from modesty, etc. We should cherish these soft values and convey them to future generations. Nevertheless, at the same time, the fact remains that more often than not the region keeps its light under a basket. We should allow ourselves to be prouder of our achievements and to present them more convincingly to the world at large as something exceptional that has come about here purely on the basis of the qualities and capacities of Eindhoven and surroundings. And the region itself should realise that many people in South East Brabant earn a good living doing this.

3. Bold enough to think big

Let us be bold enough in our region to tackle the major social themes (like energy, water, food and healthcare), say several CEOs, those at Philips at the head. These are problems with enormous range that require global solutions and for which the region's universally praised innovative ability could serve as a joint game changer. It is precisely here that our key competencies are most opportune. After all, these are major challenges and require an approach employing a wide front, comprising actors from all sorts of disciplines working together in harmony, taking the necessary steps in unison that take them forward individually or in joint ventures. It is just like with the state-of-the-art machines that roll out of the ASML factory: they derive their strengths from not just the superior technology but also from the sophisticated interaction between main producer and suppliers.
It is precisely here that the Eindhoven region is teeming with expertise. This could be utilised even better if the region was able to expand these competencies into the alpha and gamma sciences. Because knowledge and ability may be top class in Eindhoven and surroundings, the cash till is still not ringing sufficiently. This is not so strange. Since the arrival of Philips in Eindhoven, the emphasis has been on the development of new technologies and technical innovations. Many CEOs share this blood group. As a result, the marketing and sales still lag behind. Here lies a task for the future. If we are able to get new ideas to the market more quickly and become more responsive to social changes, the ecosystem will become even more robust.

4. Long live manufacturing!

Against the background of a report from MIT, the Brookings Institute and the President's Council of Advisors on Science and Technology, it is important for us to see the significance of the cohesion of things in this ecosystem and to comprehend that the high-end manufacturing industry is actually the backbone. Not solely because of its contribution to the country's treasury coffers, but also as a result of the enormous effect on R&D, the derived employment that this brings about and the contribution to the balance of trade. Strikingly, we

currently see moves that are to lead to an initial recovery of industry in the USA. Obama has this high on the agenda for his final period in office. The background for this is a recent report from the MIT that ascertained that the American ecosystem displays serious voids. The Apples of the world have already outsourced so much manufacturing and assembly to China and India that they are not even able to manufacture their own prototypes themselves in the USA. A stark contrast with our region, where the art of making is still held in great esteem.
This quality still delivers masterful results. This is most visible in the graduation show of the Design Academy students. However bizarre, weird and complicated what they dream up is, prototypes can almost always be made here. In other words: all competencies are available for prototyping and custom-made series. It is consequently of unbelievable importance that the manufacturing industry remains connected with the region.

5. Industry 4.0

On our way to Industry 4.0 it can be assumed that the importance of information technology will increase in the complex systems that the region is yet to build. This can already be observed within ASML, where more than 1,000 engineers work on embedded systems, but also at companies like VDL Sioux, and Prodrive. The municipality of Eindhoven has noticed that several software companies from India have established themselves in the region recently. The arrival of an international knowledge institute in the field of information and software development could reinforce the region and bring it more into line with the cooperation between this sector and the existing knowledge industry in the Eindhoven region. A branch of Stanford University would really be a splendid boost for the area. And why not; if you really dare to dream, the sky is the limit.

6. Recognition from The Hague

We are ourselves gradually becoming more convinced of the unique proposition that the Eindhoven region disposes of with its ecosystem and milieu of innovation. The problem, however, is that the echo from this cry still insufficiently reaches ears in The Hague. Within the government institutes and bodies, there is not yet a sharp picture of the absolute importance of the Eindhoven region for the economic future of the Netherlands. This is apparent from, among other things, a recent WRR report concerning future revenue models. So here lies another mission for the region. It is especially important for politicians and government to disclose where ‘the tricks of the trade’ are hiding in Eindhoven and surroundings. This is not just about establishing that the region makes a substantial contribution to the GNP (the policy makers have now realised this), but more especially in the multiplier effect: the enormous R&D efforts, the countless patents that this generates, plus the many jobs that are created in the extensive network of suppliers. In other words, the acquisition perspective of the whole is greater than the sum of parts.

7. In search of the new ASML

We have to get more out of the available technology in the region. Phenom, a Hans Duisters initiative that, with the table electron microscope, fills the gap between light microscopy and high-end electron microscopy and Addlab, a 3D printing initiative by Daan Kerstens and Jonas Wintermans, are wonderful examples of new cooperation in the chain. These kinds of new alliances, of which a number are to grow to world-player status, should be stimulated by the province / BOM. Not the individual companies, but the ecosystem makes the region powerful, unique and, in contrast to the system’s components, almost impossible to copy or reproduce. This ecosystem can only continue to exist if give and take are in balance: Guanxi, as the Chinese call it. We should realise that, as Katz says in relation to the metropolitan revolution, ‘the cavalry isn’t coming’. In other words: you will have to do it yourself as a region.

8. Government role

Where the ecosystem is concerned, the government is expected to be somewhat reserved. It should not be tempted to want to emulate business. Tappel: ‘we can establish that the government isn’t always equally successful at enterprise’. Feld described the role the government is expected to play as ‘setting the table’; making sure that the ‘basics’, such as education, housing, infrastructure, parks & gardens, sports etc. are top-notch.

9. Reinforcing the networks

The well-developed network structure is one of the major strengths of the region. ‘You bump into each other everywhere’, is heard across the board, from CEOs as well as from authorities and knowledge institutes. The crux of the matter is creating formal and informal networks that are active at different levels. First of all within their own ecosystem, but also between the various sub-ecosystems that have sprouted from it. Particularly

between the manufacturing industry and the designers. Of great assistance here can be that Dutch Design Week is the platform where the nerds (pioneers in technology) and the creatives (pioneers in design) can find each other and Dutch Technology Week the event where the creatives can track down the nerds. More of these kinds of connective and special events are needed to create more cross-pollination.

10. More brains and more hands

Without a sufficiently qualified workforce and good education, the Eindhoven region will lose the head start it has acquired in the last decades. Important to keep in mind here is that this does not just refer to international technology top talent but also to skilled professionals at intermediate levels. It is exactly this delicate balance between brains and hands that makes Eindhoven and surroundings stand out as a top technology region compared to other areas in Europe, Asia and the USA. We do not just think up new products, concepts and services here, we develop and manufacture them too. The close ties between the engineers and the skilled machine operators have been spotted before as an important part of the high-end manufacturing industry. The region is consequently very dependent on the availability of a technically skilled workforce. Brainport Industries and education institutes have joined forces to improve the intermediate-level education. This has resulted in a number of new and fascinating initiatives. We can also learn from Germany in this field. There, targeted measures have not just boosted the number of successful students, but a lot of trainee places have also been created.

Quality of life

The quality of life in a society is primarily a matter for the government. Government is to provide for housing, education, healthcare, roads and public transport, environment, sports and culture. But to what extent does this sum of facilities serve the economic prospects of a region? This question is difficult to answer, that much became clear to me when talking to administrators, decision-makers and entrepreneurs. 'We're not really completely sure about that', Staf Depla said, which was something many interviewees expressed along with him. Just as an ecosystem, quality of life would benefit most from people on different committees thinking about what would be evident for the region with regard to this. And subsequently acting on these findings.

Place to live and enjoy

It is of course of paramount importance that the region is an attractive place to live in for a highly educated, mainly technical workforce. Attracting talent is a first requirement, but keeping them here is another thing. For that, not only the actual situation but also the perception, or the image, is important. Let us start with the actual situation. Almost all the interviewees think that the basics are sorted. But the idea does exist that there is more emphasis on families than on young single and two-person households and that what is on offer is mainly aimed at the original inhabitants of the region. While the region has become a lot more international, a trend that will only become more apparent in the coming period.
This internationalisation is a determining factor in thinking about quality of life. The International School is a good example of this. The Eindhoven business community, with strong international orientation, labels this as an important facility for the region. This makes the International School a decisive factor for being capable of attracting foreign top talent. With regard to leisure and free time, the cosmopolitan character does not quite get enough attention yet. There is a task here to lay links between the local Eindhoven culture and other cultures. What could help in that respect is offering Chinese, Spanish and English at all primary schools in the region.

Image

Where image is concerned, the Eindhoven region still has a problem. Although the labelling as Brainport and especially the awarding of smartest region have had a very positive influence on the image of Eindhoven and surroundings, the region is still seen as too provincial and not cosmopolitan enough. Broadening the cultural scope may provide a serious boost for this image. Abroad too. There is not much sense in looking for this upgrade in more institutions. Eindhoven has a number of quality cultural facilities (Van Abbe, Muziekcentrum, Parktheater), but will never be able to compete in that area with the metropolitan regions. What's more, the region is only an hour and a half's drive away from cities like Antwerp, Amsterdam, Rotterdam, Düsseldorf and Brussels, where culture buffs can find everything they might want.
The region *has* built up an excellent reputation with a number of ground-breaking events of international appeal such as Glow, DDW and STRP. The strength of these events is that they navigate the cross-roads of various disciplines and are linked to the region's DNA in character and in execution. They are informal and flexible in set-up, have sprouted from the cooperation between various parties and have managed to hang onto their hunger

for experiment and innovation despite their public success. There are still major opportunities for further depth in these events. Glow, DDW and STRP now attract many thousands of visitors, but the original structure of hotbed and laboratory still stands. A good example of this is Glow. In Eindhoven's city centre, this has grown into a mass event with hardly space to walk, whereas Strijp S boasts the innovative activities that attract the connoisseurs. A striking detail here is the resulting new business. Lighting designer Daan Roosegaarde and Heijmans Contractors are working on a motorway concept for the future.
In brief, confrontations between different sectors that bear fruit both commercially and culturally. And are interesting for creative thinkers and doers to establish themselves in the region. A good example of this is the way in which design has grown into a sub-ecosystem. Ten years ago, almost all the talent in this area left Eindhoven, now the reverse is true. This does demand sufficient affordable studio and work space for these groups, including activities to keep them captivated. Eindhoven has always had its fair share of nerds; in the last decades they were joined by bohemians. It is imperative to leave these groups to confront each other. Such a clash leads to surprising innovations. This does require networks and high-end meeting places such as Usine and Igluu. Another thing that assists in jazzing up the image is restoring the city's icons, such as De Lichttoren and the industrial heritage in Strijp S.

Nurturing talent

Eindhoven and surroundings should not just attract knowledge workers from afar, it should also put more energy into developing own talent. Start with the children, I would say. Let them get to know engineering, design, culture, let them get their hands dirty. As they can do in the Ontdekfabriek in Strijp S for example. Tempt them to choose studies that match the economic profile of the region. Let them think and do, cross-pollinate technology and art, sports, light and so on. And continue this trend as they get older. A fine example is the Aalto University in Helsinki where engineering, arts, design and business are offered at various levels in academic education. We should have something like that in our region, not just at academic level, but also at applied university and at intermediate levels. Because without talent our ecosystem will dry up and the milieu of innovation will lose its foundations.

In conclusion, a very last tip from me: let us make sure at all times to stay close to the sandy soil. The soil of farmers and scientists that has been a lot more fertile over the last century than anyone considered possible. Way past the powers of imagination.

I owe my gratitude to
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[i] urban agglomeration of Western Holland