INTERVIEW

Scenario Planning— Exploring the Future

One factor behind the success of Royal Dutch Shell has been 'scenario planning'. In this intellectual strategy, scenarios are drawn up based on different possible futures, which can then be used to prepare for various eventualities.

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Ewald Breunesse
Energy Transition Manager

How did scenario planning come about?

Ours is a very long term business. It takes 40 or 50 years to prepare and deliver infrastructure like refineries and pipelines. We need to think about what's going to happen in the future and what we should be doing now. The idea of scenario planning is to be able to envisage and prepare for the future.

The first time it really came into its own was with the oil crisis in 1972. In the 60s and 70s a dramatic increase in car ownership caused oil consumption to shoot up. It was an extremely strong trend, but it wasn't going to continue forever. We ran simulations to see when it would reach its limit and what would happen when it did. We didn't predict the oil crisis itself. The future is always uncertain and isn't something that can be predicted. But it was one possible scenario that we came up with regarding what might happen as a result of the rocketing demand for oil. As a result, we were able to prepare an action plan, and use the oil crisis as an opportunity to turn ourselves into the number two oil company in the world.

How does it relate to management strategy?

Scenarios are one of the tools we use to create corporate strategy. For example, when Royal Dutch Shell is planning a large-scale investment, we check how that fits in with our scenarios. If we conclude that it's a good investment, fine, otherwise we come up with an alternative. Scenarios are a kind of barometer for testing the soundness of a plan. 1972 saw the publication of a book called "The Limits to Growth" which predicted that oil supplies would dry up by the year 2000. This prediction proved to be wrong, but Royal Dutch Shell has been researching alternative fuels ever since. That research bore fruit in the shape of GTL (gas-to-liquid), which is a technology for producing diesel, jet fuel and chemicals from natural gas, which is more abundant than oil.

What scenarios are you currently working with?

In 2013 we announced two global scenarios: the 'mountain scenario' and the 'ocean scenario'. We use these as guidelines to draw up individual local scenarios.

The mountain scenario assumes a powerful state. At the top of the mountain you have the elite, including governments and big, economically powerful corporations. In this scenario, power flows from the top down. Generally speaking, the government excels at providing big infrastructure, and urban planning , but on the other hand because the priority is the national interest, economic growth and energy prices are moderate. This scenario works with nation states like Japan, France and Germany.

In the ocean scenario, on the other hand, market economics play a bigger role. It's a world of competition where everyone is given equal opportunity, and ends up either a winner or a loser. There is no guarantee that even a big corporation like Shell will survive. The future is completely uncertain. But the strength of the model is that civil society can function on its own, without relying on central government. Power flows from the bottom up. Cities like Amsterdam and London, which have international connections and cultural and economic power, will probably flourish in this scenario.

What is the starting point for creating a scenario?

You start by observing trends. For example, the rising global population. Or the predicted long term growth of the economy. The increase of human knowledge, and the progress of technology. We can say that these are typical trends, and unavoidable.

One particularly important trend at the moment is in electricity and power generation. Numbers of electric vehicles, smart phones, and electric appliances are all increasing rapidly, but there are uncertainties surrounding electricity storage. Batteries aren't enough, so the issue is how to store and use electricity efficiently. For the Royal Dutch Shell energy research team, fixating on this issue has led to them working on the idea of power-to-gas. Might it be possible to convert electricity into a different form that makes it easier to store? For example, converting electricity to hydrogen and storing it as gas for later usage.

Another important trend is that things are getting smaller. Germany has abolished nuclear energy. The proposed alternative to nuclear is local power generation. Also called distributed generation, it involves setting up lots of small-scale regional power generation facilities. Between 100 and 1000 of these will form an independent energy infrastructure. This is something that is actually happening as a reaction against thermal power generation using nuclear and coal.

What we ask when faced with these trends is "what will this trend lead to in future, and where will it end?" The team coming up with scenarios does a lot of brainstorming along these lines. "If we were to wake up in the year 2040, what would we see?" The Technology Centre may still be here, but the interior might look completely different. Maybe everyone will be wearing the Google Glass, or it will already have been replaced by a different device. But what we really have to imagine is where the trends will have led us to. We brainstorm where the big trends are heading: food, water, fuel, people, cities as concentrations of people. Sometimes as we try to imagine what will happen we find we need more data. We base our ideas on the data available to us, and analyze them both quantitatively and qualitatively. Then we come up with more ideas. This combination of analysis and imagination is key to scenario planning.

MOUNTAINS 〈A view from the top〉 Social stability, the long view	OCEANS 〈A view from the horizon〉 Churn, innovation, reform
· Concentration of power: elites drive policy · Global economic growth moderates · Return of the state · Nationalist world	· Rising aspirations drive propple power · Reform unleashes market forces · It's a fast adaptors world · Open borders

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1/ The results of research into the future of energy, cities etc. are summarized in booklets.
2/ Scenarios are drawn up with the help of two driving forces: the mountain scenario, in which government has a strong guiding influence, and the ocean scenario, in which the free market economy is the global driving force.

CASE STUDY 5 **Waag Society**

Democratizing technology and supporting individual creative ability

The social innovation hub

Nieuwmarkt Square in central Amsterdam is a well-known tourist attraction and market venue. It's also the place to find programmes that connect citizens with cutting edge technology.

Waag Society
[Amsterdam]
Established: 1994
Employees: 42


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'Waag' is Dutch for 'weigh house', a public building at or within which goods, and the like, were weighed. The rooms once used by the city's guilds remain to this day. What was the masons' guildhall is now used as a meeting room. The surgeons' guild was on the same floor. Once upon a time, they carried out experimental autopsies on the corpses of criminals at the top floor. On the wall hangs Rembrandt's "The Anatomy Lesson of Dr. Nicolaes Tulp," set in this very spot.

Currently, the building is used by Waag Society. This non-profit organisation uses the building as a hub for connecting citizens with cutting edge technology and creating social innovation. An attempt to democratize technology, one could say.

The day we visited was an open day, and the place was full of people visiting the FabLab on the first floor. FabLab is a space for people to try their hand at making things. The lab is equipped with a variety of tools, including a vinyl cutter, a laser cutter, and 3D printers. All are state-of-the-art, as recommended by MIT.

FabLab is now a worldwide movement, but "we want to incorporate our users' opinions and give this place a distinct Waag Society feel," says Karen van der Moolen of Open Design Lab. In a mutually beneficial relationship, users donate artworks and furniture that they have made in return for being able to use the space for free. In fact, most of the furniture and interior decoration at Waag Society was made in FabLab.

When we visited, we got to see a furniture designer at work. He was working on a business idea that involved constructing custom made

1/ Originally built as a weigh house, and having been used for a while as a museum, the building was renovated around 20 years ago.
2/ The top floor houses an event space. The painting on the wall is Rembrandt's "The Anatomy Lesson of Dr. Nicolaes Tulp," reflecting the fact that public autopsies used to be held here.
3/ In the Age of Discovery, the ground floor was a weigh house, while the first floor housed the guilds. As much as possible of the original exterior and interior has been retained.

furniture based on 3D drawings. A Japanese lady brought her daughter along. She told us she lived nearby and that her daughter loved science. “Today we made stickers!”

The lab was strewn with product prototypes; a glance at the wall revealed an artificial leg. Apparently one research team is developing an artificial leg to be used in places like Indonesia. Rather than metal, they are experimenting with materials that are easy to come by locally, like bamboo and pineapple and banana fibres.

Waag Society also runs a public participation programme. There are six research programmes, including Creative Care Lab for innovation in health care, and Creative Learning Lab which develops programmes to teach children about technology. However, the programme which uses this building the most is Open Design Lab, because a lot of what it does involves working with materials and it has is close ties with FabLab. Karien Vermulen tells us about Open Design Lab’s current project.

“The big energy companies, the Ministry of Finance, and Waag Society are working together on smart metres. These continuously upload data on household energy consumption, and Europe is moving towards making them compulsory. But people don’t understand how they work. Here, people get to take them apart, look inside, and think about the data and how it’s used. It all started when an energy company approached Waag Society for advice.”

A lot of the projects undertaken by the six labs start, like this one, with proposals from third parties. Some projects involve Waag Society as a whole, but if the nature of the project is clear-cut, it will be split between the relevant labs.

Lab members come from a wide range of backgrounds including media research, intercultural communication, psychology, architecture, film, engineering and industrial design. Everyone belongs to one of the labs, but it’s not unusual for them to be called on to help out other labs with their knowledge and skills, or for different labs to work together.

Since Waag Society’s mission is social innovation, projects extend beyond the walls of this building. It’s usual for universities, media partners, and experts, as well as the users who will directly benefit from the technology to be involved. Quite often members of the public will bring their own ideas along to open days. Once a year, external third parties are involved in reviewing the research agenda of each of the labs. It’s an opportunity to thoroughly scrutinise whether those agendas are of value to society.

Waag Society started in 1994. The foundation was set up as a place for all citizens, including artists, to have a chance to use the internet. Over the years it has taken on new technologies including in health care, fabrication, biotechnology, and neurotechnology. Its primary mission is to help disseminate these cutting edge technologies and help them take hold among ordinary people. That’s not to say, though, that Waag Society hasn’t also succeeded at coming up with products that make use of new technologies.

“We’ve set up start-ups with the aim of bringing the fruits of the labs’ research to market. Waag Society spin-offs: One of them is Fairphone, a social enterprise. As a foundation, we can’t be directly involved, so they’ve set themselves up as an independent company,” says Director Marleen Stikker.

20% of funding comes from the creative industries fund, the City of Amsterdam, and the Ministry of Culture. Another 50% comes from European programmes related to education and health care. The remainder is provided by corporations and other groups as joint research costs or as part of research agreements.

Despite this, Waag Society remains an independent foundation and is not affiliated to any university or to the government. All achievements are released into the public domain and shared, with the aim, naturally, of encouraging social innovation. Open research, open source… you name it, it’s open. Spin-offs can be created if necessary, but even these are required to be social enterprises. They may be market-driven, but they are not shareholder-driven. You could say that what drives them is social contribution.

There’s a chance that more labs may be added in future, but only if they contribute to society at large. Says Stikker, “The question is whether it will impact the future of society. Then there’s the sense of playfulness and passion of the people proposing the project, and Waag Society’s own philosophy of releasing technology into the public domain. We’ll take on any project as long as it meets these criteria.” By giving people access to technology, Waag Society is boosting the creativity of individuals in the Netherlands.

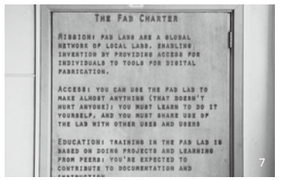
4/ FabLab provides MIT-recommended equipment including a vinyl cutter, a laser cutter, milling machines and 3D printers.
5/ What used to be the masons’ guild room is now a meeting room. This space was made to demonstrate bricklayers’ skill.
6/ This space is used for workshops among other things. Different spaces merge seamlessly together throughout the building.
7/ FabLab’s ‘Fab Charter’ sets out the organization’s mission.
8/ This board game created by a former FabLab intern as a graduation piece is now on display in FabLab.
9/ This well equipped space is used for electronics work.
10/ This artificial leg is displayed on the wall. FabLab is currently working on developing an affordable, adjustable artificial leg that will be made available locally in places like Indonesia.
11/ Open Wetlab deals with biotechnology and life sciences.
12/ A photograph of an artist who has collaborated with Waag Society hangs on the wall.
13/ The finished panel is the result of repeated attempts to burn a photograph onto wood.
14/ Open Wetlab is experimenting with the development of a new kind of paint using bacterial pigment instead of ink.
15/ This meeting room makes use of dead space in a corner of the building. Although it only fits a few people, a lot of users like the shut-off feel of the space.
16/ A furniture designer in action. He is experimenting with a new business idea that will allow customers to adjust the size of their furniture based on a 3D blueprint.
17/ Young men using a laser cutter. They plan to use the laser to turn their friend’s graduation photo into a retro-feel present.

(from left)

Marleen Stikker
Director

Karien Vermeulen
Creative Learning Lab

Karen van der Moolen
Open Design Lab



The six Waag Society labs

Creative Care Lab

A lab for health care research, Creative Care Lab is currently working with an external company to design an interface for a wearable artificial pancreas developed for diabetes sufferers. Because of the need for biological science expertise, it also cooperates with an external biotech lab.

Creative Learning Lab

This educational research lab develops programmes that teach children about technology in new ways. Its main project at the moment is a collaboration with FabLab called “FabSchool”. It’s an attempt to encourage children to use new technology in creative ways.

Future Heritage Lab

This lab researches how our heritage can be preserved, and how it can be used in the future. In recent years many museums have begun digitizing their archives, and recording paintings and sculptures as digital images. This lab is working towards making these archives publically available.

Future Internet Lab

This internet lab for developing new programmes, apps, etc. works with the government to plan and run public participation programmes. It is currently researching ways of sharing and utilising big data from cities throughout Europe via an app.

Open Design Lab

Currently this open design lab is working on a project surrounding smart meters, which in recent years have started to look like they will be made compulsory in Europe. The lab attempts to build relationships between new technology and people.

Open Wetlab

This lab aims to create a sense of added value by fusing art and science. It is currently working in the field of bio-art design, and is also part of the international science community. It is involved in furthering discussion on the ethics of life.