Inaugural address Prof. A.S. Hassoldt

To the right of the Hype Cycle
Managing complex issues

TUDelft

Inaugural address 8 October 2021

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By

Prof. Aukje Hassoldt

Rector Magnificus, members of the Executive Board, my fellow Professors and other members of the university community,
Esteemed guests,

Ladies and gentlemen,

Welcome to this inaugural address. How nice to see you all here! Since the first of October 2019, I have been Dean of the Faculty of Technology, Policy and Management, and also a Professor. Normally, an inaugural address takes place after about a year, but then COVID-19 came along. However, this has given me time to immerse myself further in the faculty, and to see what kind of people work here. Fantastic people! Generally, people who cannot be pigeon-holed, and who inspire others! It has also given me time to start working with everyone on our plans and ambitions for the next few years.

Today, I am taking you with me on a tour of the work of the faculty and of my own ideas. While doing so, I will also briefly touch on our ambitions for the years ahead, which can also be found in our new Multi-Year Plan[1], without going into the plan in its entirety.

This speech is divided into three parts. In Part I, I will be talking about complex issues. In Part II, I will discuss how to make progress when dealing with complex issues. And Part III will be all about how to manage such complex issues.

Complex issues

Making progress
on complex issues

Managing
complex issues

Part I - Complex Issues

At this morning's symposium, Saba, Nitesh, Behnam and Jan outlined what our Faculty does[2]. The grand challenges of this moment in time, the major social problems we would like to solve: these all have a technological component, and increasingly so. But these are also taking place in a complicated world with many different players, who have different interests and also different opinions about which way things should go. Behind all of this are further differences in standards, values and knowledge. It's a world of many rules, containing current and desired policies, a lot of history, many organisations, with systems that are outdated or incompatible, et cetera, et cetera.

The task of making progress within this world, and of solving grand challenges in that complex, sociotechnical system, lies at the heart of our faculty. To this end, we use theories, methods and techniques taken from the natural and engineering (STEM) sciences, social sciences and humanities. We examine everything from three perspectives: the system, values and governance.

Warren Walker, one of our founders, once said to me, "When I first started, I wanted to solve societal problems through mathematics." Well, solving societal problems through mathematics means looking at society from a STEM science angle. This is still one of the fundamentals for us as a faculty. Just look at our modelling knowledge, as well as our solid position in IT and cybersecurity. What's more, the group that put its mathematics, modelling and IT knowledge to work also had strengths in public administration and system analysis. At the same time, another group from which we developed had considerable knowledge of ethics, management and economics. All of this has meant that we can form strong combinations. This in turn enables us to use a variety of methods and approaches, ranging from formal optimisation models to numerical simulation models and ways of dealing with complex data sets, and from empirical social science research to theory development. While analysing and certainly also designing, all the way.

We teach our students this approach as well. And we also teach it to students throughout the whole university, to whom we offer courses in ethics, entrepreneurship and academic skills. Thirty years ago, following the advice[3] of the committee led by Henk Zeevalking, the former minister and former president of TU Delft, the decision was made to set up our Technische Bestuurskunde (Systems Engineering, Policy Analysis & Management) programme. We still teach it today and with great success. Nowadays, we also have six master's programmes.

'Where society meets technology', you might say.

And which domains do we apply all this to? Well, we work on issues found in areas such as the digital society, climate change & energy transition, urbanisation, transport, security and health.
Over the last few years, healthcare didn't appear on this list. Yet you have to deal with complex issues in the healthcare sphere too. And to my surprise, I found we actually already had 20 scientists working with us in the field of healthcare and public health. So from now on, we will also include healthcare on our list of domains. And we will continue to invest in it.
What all these fields have in common is that you don't work on your own. Cooperation is in our blood; we have a large external network, both nationally and internationally.

When I first started here, I thought we could sharpen our positioning. We have therefore rewritten it in our Multi-Year Plan, in line with what I have just briefly described. We are doing research into major social issues with a technological component in a complex setting[4]. There is also a great deal of interest in this worldwide. In fact, you can't open a newspaper without seeing a considerable number of articles about it. It's a very topical subject.

The faculty comprises 350 FTE, including 290 FTE who are scientific staff. Within a faculty such as ours, groups such as our 100 external PhD students also form a significant number. If you include everyone, we have 630 people in all. Larger than we ourselves realised. I have looked around other universities, internationally, to see whether they have a similar research focus. I found several, but none larger than 30 or so people. Not a whole faculty. However,

wherever they were based, they all expressed the ambition to increase their focus on this field and put more effort into it. We are a leader in this respect. Over the next few years, we want to make the most of our research leadership to increase our visibility. We also notice that more and more people are interested in working with us, or want to work with us.

Going back to the complex situation, 'complex' comes from 'com' (meaning 'together') and 'plectere' (to plait[5]). So it refers to something plaited together, and I think that expresses it very well. It's right in front of you, and you can see that it's complex.

We all recognise this situation: you see a social problem, and you would like to solve it. You want to go one way, but other people want to go in another direction. You sometimes feel insignificant within that big picture, so how can you make any progress?
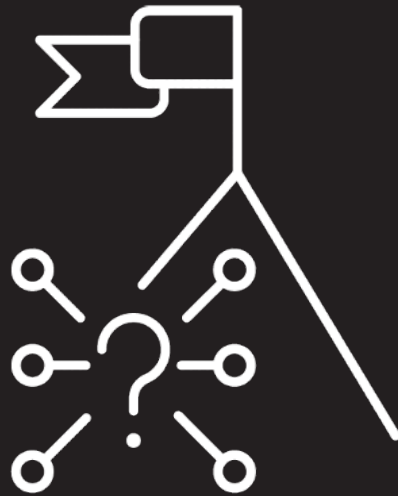
The Dutch group De Dijk expressed it well in the nineties, in their song 'Dansen op de vulkaan' ('Dancing on the Volcano'). I didn't notice it at the time, but the lyrics talk about 'they'. In English, it means: "They'll do what they want anyway. Even if the whole world has to come to an end. Darling, put something nice on. Then we'll go dancing, dancing, dancing".[6] Yes, let's do it again soon: dance, if we can. "They'll do what they want anyway". On social media today, there's a lot more talk about 'they'. However, there's no such thing as 'they'.

There's no such thing as 'they'

After all, this is what's happening with all of us. We all feel like a very small part of a very big picture. Some of us may feel like we have more control than others, but nobody feels on top of the world. And we are not. A sense of 'they' is a sign of complexity.

There's still a lot to do. But what I want to argue is that we are all really making good progress. So even though it may feel big and complex and you get the sense that you're only a small part of it, a small cog in a big wheel, as a world we are indeed moving ahead. There are 7 billion of us. That may well be our weakness, but it is also our strength. Because if you look at what we are doing, we are all spending a lot of time trying to resolve issues.

Part II Making progress on complex issues

I'm pleased with all the attention being paid to the climate crisis. Without a sense of urgency, we cannot make any progress. And it is urgent – let that be clear. In my opinion, we have entered a new phase with regard to the essential energy transition. A few months ago, there was a great infographic[7] in the FD about how we could achieve a CO2-neutral society by 2050. It was quite specific about which questions we still need to answer, which technologies we still need to develop, which actors are involved, what companies should do, what the government and we as citizens should do, which energy combination to use, and so on. The same goes for the International Energy Agency, which came up with a path study[8] before the summer stating that if we follow this particular path, and take these particular steps, we will achieve our goals in 2050. It is a narrow path, but it is possible. Our own professors Zofia Lukszo and Kornelis Blok, and our colleague Ad van Wijk of TU Delft, also see such a clearly laid-out path. The IPCC study of Working Group III that will be published next year will also focus on this.[9] So it is starting to become clear what you have to do to reach those goals, even though it will not be easy to do so. But as recently as about 5 years ago, we were much more in the dark.

However, with regard to the circular economy, for example, we're not that close yet, in my opinion. In fact, we still have to figure out which questions we need to answer in this respect, and for instance how the public will actually react to circularity.

But here's another example of how far we've got already. Mark Twain – and I'm not the first person to quote him in an inaugural address – wrote a travel book called Roughing it[10], based on his own experiences. It's set in around 1860. The middle of America was not yet part of the United States. This is an ink drawing from that book.


In his account, the lack of safety is most striking. A holiday trip in a rowing boat that he barely survives; a long and dangerous crossing of the Midwest via the stagecoach system, with criminals who control it and shoot each other before the travellers' very eyes. Rivers that suddenly swell into torrents. An exploding boiler. Travelling with his brother to his new job in Nevada and then getting lost in the snow and nearly freezing to death. In his autobiography, he writes that when he was young, around 1845, you would see a fatal accident happen right in front of you every few years.[11] You would be upset for a few weeks and then it was all right again and you were glad it wasn't you. Later on, in his autobiography , he cited US Congress figures for accidents on the US railroads around 1905: 10,000 deaths and 60,000 injuries per year. These are really high numbers if you let them sink in. Imagine living in America at the time and knowing about the number of accidents on the railroads. Thinking about all those railroad companies. About the train builders. About the many passengers. About all those unguarded crossings. And all the people working on the railroads. The poor healthcare facilities if you had an accident. How on earth could you make it all safer? And yet, by all working together, we managed to do so. We were able to adjust that complex system after all. And in the Netherlands, we are now close to zero railway fatalities[14].

As a faculty, this is something else we are working on. We're also working on making the chemical industry safer, as well as on reducing avoidable damage and avoidable deaths in the healthcare system via the Centre for Safety in Health Care, which was established last year at our faculty.[15]

These were just a few examples of the progress we have made, all of us together, and of course there are many more.

I was just pondering on what comes to mind when you think of technology. Well, roughly speaking, it can be described in three ways: 'hip', 'Elon Musk', and 'difficult'.

Source: Gartner
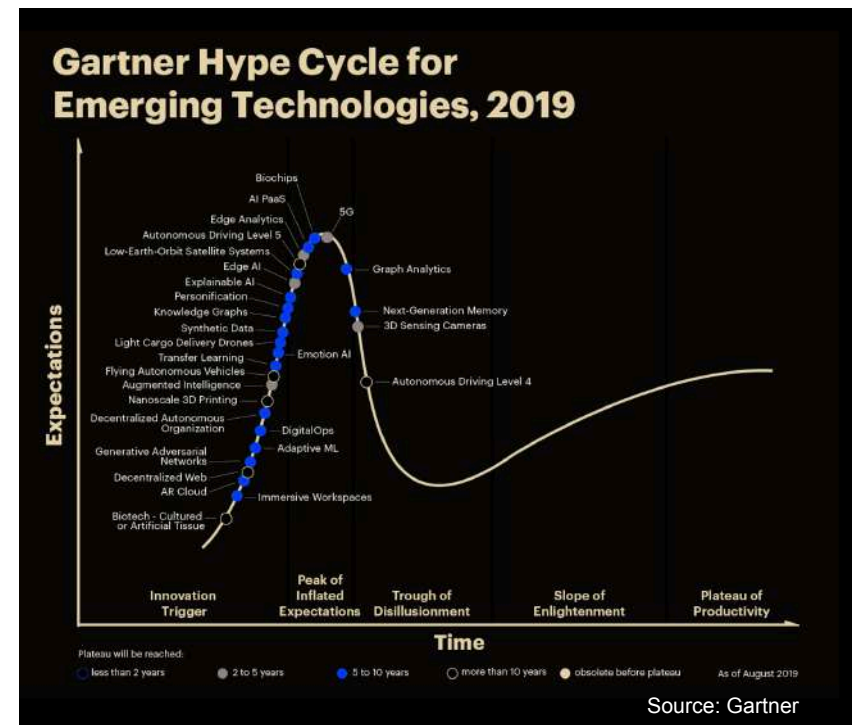
You may be familiar with Gartner's Hype Cycle. Gartner[16] is a company in the IT world that informs people about new and existing technologies. (And no, I don't have any shares in Gartner!) This Hype Cycle[17] is an undulating shape. On the left side, you have emerging technologies that show promise. Then above

that you have the peak of exaggerated expectations. Then you get a trough of disillusionment, and only then do you get a plateau of productivity. And those graphics are very empty on the right-hand side, on the productivity plateau. They're all about the hip part of the left-hand side. Yet I believe that we are actually all on the right-hand side.
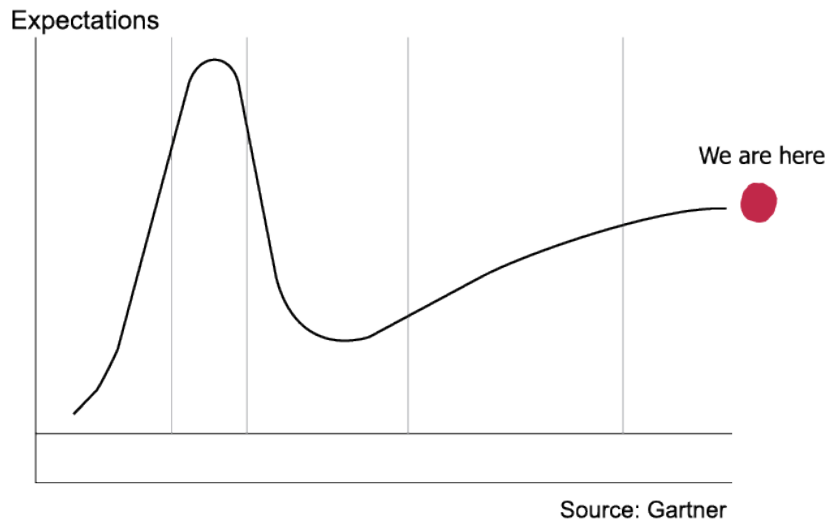
Because that right-hand side is where you are dealing with a whole patchwork of systems, rules, historical systems that don't fit together properly, cultures, and different ways of doing things. Where you are dealing with things that you acquired based on the hypes of 15 years ago. That area on the right is precisely where we are all struggling, but also where we are making progress. It's logical that Gartner leaves this blank, because that is not the purpose of the graphic for them. But we can come to the realisation that we are actually all operating on the right-hand side.

If you work in IT at an organisation, that's very frustrating. You are working in a very hip world, and all the people you talk to want the very latest thing, because they've read about it. But you are mainly busy saving the day, connecting the systems together, updating them to guard against attacks, convincing people that they need to update things, keeping old data readable for new models, and so on and so forth.

I would argue that Elon Musk is very good at that right-hand side too. While we would perhaps all place him in that hip left-hand side, he's actually very good at handling situations where things are hectic, where everything's full, and where everyone thinks, "we can't get anywhere here". This is where he can muster the power to cut through. He doesn't just start from scratch; rather, he's good at getting through that whole complex system.

So it's about keeping on going, and making progress, together. In a group.

I do think analytically, but I mainly think in terms of groups. Groups are absolutely fascinating. They make things happen, whether smoothly or with great difficulty. Don't get me wrong: I love people, individuals, and every last one of you. But I think in terms of an individual within a group. Maybe that's because our bookshelves at home when I was young used to contain books such as Group Dynamics[18] and Individuals In Groups[19].

We should think more in terms of groups when trying to solve our societal problems.

Groups have attained a certain notoriety within our individualistic society due to aspects such as peer pressure, yet groups – or organisations – also allow you to get further than you could on your own. And not everyone in the group has to be able to do, or has to be, the same. In fact, you have to be different in order to get further ahead. So groups should allow room for differences within them. For diversity, and for the individual. By the way, this week is the week of diversity and inclusion at TU Delft. So this approach fits in well.

**We should think more
in terms of groups,
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for differences when solving
our societal problems**

Let's then think in terms of groups: groups that allow space for individual differences, so that the group makes progress as a whole. But also, let's bear in mind that there are different kinds of groups. You will not feel at home in all of them, and you won't fit in with all of them. So you may decide you'd be better off in another group.

While preparing our Multi-Year Plan, we asked a group of our talented young scientists what they would like to see in it. The message was loud and clear: team science! So that's what we have included.

Team Science

But what do we mean by that? Team Science essentially means working together. That's pretty obvious. And no, not everything has to be a team effort; there are plenty of activities that you can enjoy spending some time getting to grips with on your own. But team science covers an important structural element: the elimination of stimuli that hinder cooperation. There are many aspects to this, such as valuing team efforts, considering it normal to approach one another, and not thinking solely in terms of your own organisational unit. In that sense, it fits in very well with the VSNU pamphlet about recognition and rewards[20]. And it fits in with our being a campus university[21]. One where students and staff can meet up with each other in a setting where the focus is on learning, developing yourself and transferring knowledge. However, it's not yet easy to do 'team science' because science is an international world, so you would almost be changing the culture on a global scale. But hey, we were used to getting through complex issues, weren't we? We're used to working long and hard to get anywhere. And we find that we're attracting top international people through our emphasis on collaboration and through our positioning. We are vigorously challenging the idea that top science is by definition individualisti.

Having now worked at the Delft University of Technology for two years, I can also say that I really like it here. What I appreciate is that we are quick to pick up on ideas, and to make use of the brainpower that exists here.
Furthermore, TU Delft is relatively centralised as universities go, with a lot of freedom within its frameworks. In other words, you don't have to reinvent the wheel. There's a tremendous team spirit and a willingness to help and support one another, for example among the deans. This is something I greatly cherish. Another very important thing is that TU Delft is financially transparent. Everyone can see the ins and outs of our cash flows. This is very important, because it removes a possible cause of internal distrust or unrest. Finances (in terms of red or black figures) are not only a guide to how an organisation is doing, but also very much influence the atmosphere and the sense of security within the organisation.

Thinking in terms of groups and using the space within groups in fact already takes us up to Part III of this inaugural address, which deals with managing complex issues.

Part III Managing Complex Issues

The subtitle of this address is 'Managing Complex Issues'. But can you actually manage issues? Hmm, that's the question. You may be managing society or a part of it, and have the desire to solve a complex issue. But managing complex issues 'at', 'in', 'with' or 'at a time of' isn't something that can be phrased particularly beautifully in Dutch, where we would use the word 'besturen'.

Besturen

Yet this Dutch word 'besturen' is actually rather lovely. It means 'to steer' as well as 'to manage', and is used when describing public as well as private organisations, for instance to say what a company director does. It doesn't have this dual sense in English or many other languages. So I want to clarify that I am explicitly referring to both meanings of 'besturen', and that I will link it to both public and private organisations in this speech. I myself was trained as a STEM scientist (a physicist to be precise), went on to do governance research projects and then went into management. These elements are reflected in this inaugural address.

What we call 'Bestuurskunde' (public administration or governance) is about governing organisations and society, so it's all about who does what, who has which responsibilities, how do we organise this or that, who actually sets the rules, how do we supervise things, and so on. My contention is that we in the world today have not yet reached the point of looking at technology through governance spectacles.

So I would like to give you an example of what our faculty does in terms of research, to outline what you can do with a governance perspective on technology.

This is an example from the field of cybersecurity, which professor Michel van Eeten and his group are involved with[22]. They examine the attacks that take place on the internet. This happens in-house: we have a number of systems in our building that monitor attacks. We also get data from the police and the National Cyber Security Centre, for instance. By combining such data, we get a picture of the attacks on the internet. This shows that the origin of the attacks is skewed across different providers. So we then talk to the joint providers, to establish a kind of benchmark. And then we also give advice to, and do research commissioned by, the supervisory authority. At their request, we consider how you can supervise this cybersecurity world. That gives you an outline of our type of research, which deals both with the technological aspects and the governance aspects.
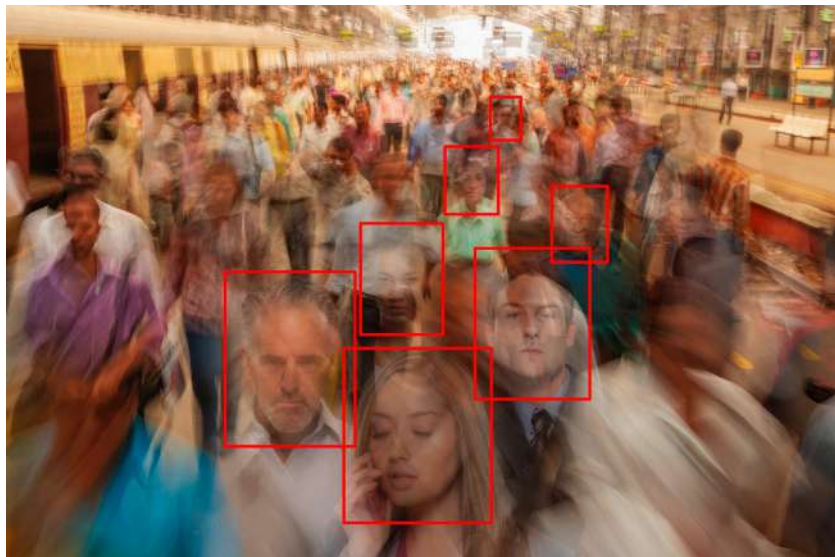
Here's another example of governing technology: one that's more on the boundary of ethics. In our Multi-Year Plan, we have indicated – among other things – that we want to further expand our work in the area of Artificial Intelligence (AI). We already undertook activities in this area last year. And we already have a track record in the field of AI, both as a faculty[23] and certainly also in terms of TU Delft as a whole[24].

This spring, the European Union took an important step by deciding to impose restrictions on AI systems[25], as you may have seen. The various types of AI systems have been divided into different categories. For high-risk AI systems, the EU wants to set rules to ensure that these are sustainable, safe, inclusive and reliable. People from our faculty played a role in these preparations.
Some people say that this means Europe is sidelining itself. But research, such as that carried out by Anu Bradford[26] of Columbia University, proves otherwise. It shows that if a large and attractive market (like the prosperous EU, with its 450 million people[27]) starts setting high standards, these soon become the norm worldwide as well. And that is precisely what appears to help innovation to move forward[28]. In my opinion, the EU has taken an important step here in thinking about how to govern technologies. And it's not alone in this.

Australia[29] and the United States are also placing restrictions on tech companies. And of course China has also become very active in this respect in recent months[30], albeit on the basis of a different agenda.

Let's now move on to the other meaning of the word 'besturen', by which I am referring to managing an organisation.

Governing, leading, managing, … there are different nuances, but these words all express more or less the same thing and I deliberately use these terms interchangeably. This also allows me to avoid any differences in status that may be felt to exist. Management is a profession. A great profession. Because essentially, it is about how to live well together.

Management is about
living together

It's also quite a precise profession, because the difference between good and bad management lies in the nuances.

I have been managing groups of more than 100 people since 2008. When I started, I wondered what the essence was of leading larger groups, through a layer of managers. Since then, I have tried to formulate some answers.

There are many definitions of what senior management in large organisations actually is. I will just discuss two of them as we've only got a limited amount of time today, but also because they are interesting and illuminate very different angles.

Let's take the first one. According to this definition, higher management means having a group around you that knows which way you want to go. You often hear this in connection with leadership and vision[31]. This definition is about the group directly below you, which in turn manages the groups below them. The essence of this approach is that you are not there all the time. You need to know that everyone has the same direction in mind and can fill in the details accordingly. It is formulated in a very top-down way. I would like to reformulate it as follows: leadership means determining together with your group (in which you have a special role, namely that of the leader) which direction you want to go in, and sticking to that path together.

The second one is completely different. Here, leadership means getting a group to adapt to a new situation on their own. This one is by Ronald Heifetz[32], with thanks to Paul 't Hart. It was through him that I learned about Heifetz' theory. This approach is about a group – and the individuals in that group – improving themselves. You as a leader cannot do that for them. However, you can create the conditions, provide support, enhance awareness, organise certain situations, and maybe even put on some pressure so that they get on with things themselves. You observe what happens. For this, you need a certain degree of independence as a leader. And you need to be able to think from the perspective of one or two levels higher in the organisation at each level. So I think about it at TU level and I ask my department chairs to think at faculty level or also at TU level.

I've noted down a few points that, in my experience, describe how to manage complex organisations and how leaders can or should lead. Of course, it will never be a complete list, but it still shows a lot. Let me go through them fairly quickly.

- Make progress and persevere in solving complex issues, and
- Think in terms of groups. I've already mentioned these two.
- Establish frameworks and then express your expectations, leaving space for personal initiatives and for diversity. Everyone really likes having space and having a framework. It's not nice to have no space, but it's also not nice to have no frameworks. This space provides you all with the flexibility to respond to the constantly changing outside world together.
- Share where you're going and what the rules are with one another, and adjust these if necessary. Do try to keep it simple. Keeping things simple is hard.
- Appoint good people. Appoint good managers. And let people develop and grow.
- Set boundaries where things are going wrong and where there may be unacceptable behaviour.
- A good organisational structure is a huge help, and is often undervalued.
- If your organisation attracts attention from society, and feels it's under the spotlight, you must be able to discuss issues very quickly internally and communicate very quickly with the outside world. You need to organise this capability in place before you need it.
- Listen out for any signals, and let information flow to and forth between the various organisational layers.
- Demonstrate understanding for differences between people and different points of view, explain why something is happening or why a certain choice is being made. Give your reasons.

- Let everyone think at the level of the next level up, as I've already mentioned.
- Don't let inequalities become too large – this is crucial to ensuring the goodwill of the group, which is in turn necessary for the long haul.
- And have a network. Actively approach new people and get to know them.

That is my outline of how to manage large organisations. Much of it can also be applied to managing large, complex projects. And I would also argue that many comparisons can be drawn with managing a country. But there are also differences, of course, especially with regard to the public at large, who are more a diverse and critical group. Within an organisation, you have basically chosen one another, whereas in a country you just have to deal with one another.

Now I will move on to the relationship between companies and governments. Over the past few decades, we have seen the rise of very large, global corporations[33]. Apple, Microsoft, Google's parent company Alphabet, Amazon and Facebook all have a market value of more than one trillion dollars: that's 13 figures. These are very powerful companies that have a lot of data and are near-monopolies.

I would argue that large, global companies also require large governmental units. The rise of the big tech companies has given the European Union a boost.

EUROPA

Nederland zendt wensenlijstje voor hardere aanpak big tech naar Brussel

Mathijs Schiffers   9 sept   18:37

For instance, take this headline in the FD last month: 'The Netherlands sends Brussels wish list for tougher big tech approach'[34] The headline is telling, and so is the text of the article: the Netherlands, Germany and France think it is already quite normal for the EU to do this. The EU is so big that it can impose some rules on these companies and redirect them.

If you look at the developments in new companies, in start-ups, or in entrepreneurship, the emphasis is now on fast scale-ups. There too, the emphasis is on going large. Just look at companies that are being created at high speed from scratch, make no profit for years but do everything they can to achieve growth, have high stock market prices despite the fact that they make no profit, and then all of a sudden have arrived – in a big way. Tesla[35] is an example of this, but so is our own Picnic[36].
Entrepreneurship is very popular at the moment. We are also noticing this in the education we provide for the entire TU in that field. Entrepreneurship is also a great thing. But being an entrepreneur has not become any easier. On the one hand, there is more funding to be found at the moment, but on the other hand, the expectation is that there will be huge growth immediately, preferably resulting in the next mega-company.

Management thinker Peter Drucker put this very well: no institution can possibly survive if it needs geniuses or superhumans to manage it. It must be organised in such a way as to be able to get along under a leadership composed of average human beings[37].

In the business world, people have already realised this. But that's not yet true of government. In recent years, we have expected superhuman perfection from our government ministers. But things are bound to go wrong if we expect people who manage a country to be superhuman. Of course, they must be experienced, well-educated and have integrity. A mixture of experience and integrity is very important. And I'm not saying that everything is going perfectly at the moment. But they are ordinary people who are doing their best, just like

us. However, in our Parliament, as well as in the media, we constantly hear other noises. Harsh, negative noises. The 'they' is projected onto our government ministers, as if they were all-powerful. Fortunately, in the Netherlands, they are not.
I don't know many people who would like to make their career in politics. But because of this, we are unconsciously making our group of potential political leaders too small.

As I already mentioned, government ministers are average human beings who must have experience and integrity. And they must be willing to share power. It's all about ensuring a balance of power.

"No institution can possibly survive if it needs geniuses or supermen to manage it"

- Peter Drucker

Back to that complex situation. Okay, by now you know that there is no such thing as 'they'. That you feel like a small cog in a big wheel , although in fact everyone else feels that way too. And that there are, in fact, possibilities if you persevere. So you get to work. You know a good solution. But then someone else comes along and wants to go in a different direction. That's pretty annoying! You just want your own solution. But you also know that it would be even worse if nobody ever considered your solution. So you realise very clearly that you have to meet and discuss and listen. And that you have to share power.

To make sure that no one can seize all the power themselves over a long period, you share power yourself too.

In my view, democracy is the best way of sharing power. And as I just said, it's very human to occasionally be disappointed that other people aren't listening to you. So for a moment, you don't want to share power. You could also say that democracy entails sharing power by means of a system that is sufficiently robust to endure even when all sorts of people don't want to share power for a while. And it is in fact robust now, as it would take several years to put it out of action, as some current examples show. We also have this kind of thing in organisations, where it is referred to as 'functional hierarchy' and where we also have all kinds of checks and balances.

Seen in this light, statements about other countries such as 'democracy doesn't suit them' or 'democracy is western' are nonsense. All over the world, people – ordinary citizens – want to prevent a single person or party from always getting their own way. It's simply human nature. Of course, you can always argue about which system you should use to achieve this.

In this address, I have outlined many aspects of governing complex issues. Yes, we are making progress. But the way we are working with the current COVID-19 situation is the way it is, even though we would like things to be different. It's chaotic, there is hassle, there are victims to mourn, there is discontent, rules have to be made, there is a lot of communication and yet still not enough, arguments go back and forth, there are discussions, we organise things, we navigate between what is imposed on us and what we determine ourselves, and that is how we make progress. Governance is done by average human beings: people who have integrity and experience but who are still just average human beings. The system in which all of this takes place is robust, but not perfect. What's more, something I've not particularly focused on in this speech is that malpractice and criminality must be taken into account. A robust system must be able to cope with that too. It must not be turned easily into a system that facilitates crime and oppression.

We can only achieve all this by working together with a lot of different people. And especially with a lot of different organisations.

In that respect, we who are present here this afternoon, in the Auditorium and online, are a very powerful group. Let us all be aware of that. So I would like to invite you to come together. To share power. To keep working hard with each other to solve those complex issues and to make real progress.

Closing remarks

And so I have taken you with me through the faculty, our plans and our positioning with regard to moving forward in major societal issues that have a technical component, within a complex setting. And from there to the feeling of 'they' and the feeling of being small yet still able to make good progress together. And further on to thinking in terms of the possibilities of groups. To the two meanings of 'besturen' and the relationship between large governments and large companies. And thence to managing large organisations. To realising that good management is so important because it is about living well together. And from there to governing a country and sharing power. And then back again to what we can do ourselves.

I hope that I have been able to take you with me on this journey that we are all on. And that I have been able to inspire you.

It's traditional to conclude with a word of thanks. Quite simply, I want to thank you all. Because I owe each and every one of you something, in the different phases of my life. I would especially like to thank my husband and my two children. You are my safe and wonderful foundation.

I hereby conclude my address.

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*The Faculty of Technology, Policy and Management wants to help shape the future through
world-class research, education and innovation.*
*In today's society, where issues cannot be solved through a single approach or from a single
perspective, we research the interaction between society and technology. Our strength lies in
analysing and modelling the complex sociotechnological systems in which these issues play
out, and in developing solutions to tackle big societal challenges. In this respect, our focus is
on social issues in areas such as digital society, climate change and energy transition, urbani-
sation, transport, security, and health and well-being. Here, we put together insights from the
technical sciences, social sciences and humanities, looking at and dealing with issues from
three perspectives: systems, values and governance. Our extensive network is both nationally
and internationally oriented.*

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