

# Images of supply chains

Citation for published version (APA):

Vos, B. (2022). *Images of supply chains: Transition paths towards a sustainable future*. Maastricht University. <https://doi.org/10.26481/spe.20221028bv>

## Document status and date:

Published: 28/10/2022

## DOI:

[10.26481/spe.20221028bv](https://doi.org/10.26481/spe.20221028bv)

## Document Version:

Publisher's PDF, also known as Version of record

## Please check the document version of this publication:

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**Images of supply chains:  
Transition paths towards a sustainable future**

*Inaugural address*

*Maastricht, October 28, 2022*

Bart Vos, Professor in Supply Chain Innovation  
Brightlands Institute for Supply Chain Innovation  
School of Business & Economics,  
Maastricht University

Dear Pro-Rector,  
Dear colleagues,  
Dear friends, here in person today or via the livestream,

Welcome to my inaugural address, about time over three years after my appointment in Maastricht. As you probably can imagine, a certain virus caused some delay. Of course I could have done it online, but just like my colleague from Utrecht University, Fredo Schotanus<sup>1</sup>, I opted for a lecture in this beautiful aula, together with family, friends and colleagues.

People who know me well may also wonder why there is no link with a Dijk song in the title, just like the “volcano dancing” title of my inaugural address in Tilburg back in 2004<sup>2</sup>. Especially now my heroes announced to stop after rocking for over 40 years, it would certainly have been appropriate to make such a link once more. Still, this time I decided to refer to Dijk songs throughout the text, so keep paying attention!

It actually already starts with a song from 1987, “Wakker in een vreemde wereld” (something like waking up in a strange world), a title which is sadly enough still very appropriate nowadays. In our supply chain domain we call this VUCA: volatile, uncertain, complex, ambiguous. I only have to refer to the Covid-19 pandemic and the ongoing war in the Ukraine to illustrate this VUCA reality. More specifically, a single container ship stranded in the Suez canal March 2021, caused major disruptions in global supply chains in many industries. It is quite likely that a lot of you faced the consequences, for example in the form of late deliveries, maybe without explicitly knowing the root causes.

It is, however, not my intention to give a very gloomy inaugural address today, just like the two grumpy old men in the Muppet show. But sometimes I do feel like the milkman in another Dijk classic, “Milkman with the blues”, thirty years old, but still all to true: “het rommelt in de verte, het komt alsmaar dichterbij”. And although it is difficult to ignore that approaching rumbling, my idea rather is to sketch some potential transition paths to more sustainable supply chains, a quest I already started in Tilburg almost 20 years ago. In doing so, two concepts play a crucial role.

The first one is the phenomenon of co-creation, also prominent in the inaugural speech of my Fontys colleague Victor Verboeket<sup>3</sup>, and an indirect link to the Dijk hit “Niemand kan het alleen”, to be translated as “no one can do it alone”. That is for sure true for the supply chain domain dealing with major transitions ahead of us, requiring the active involvement of many groups of stakeholders. I will come back to that later on, but it also applies to this address itself. Probably not surprising, I will do the talking, but most visuals on the screen are created by my son Luuk. Next, during the reception after this address, you will listen to my daughter Nienke playing her keyboard. Finally, my daughter Eline plays an indirect, yet crucial role during the intermezzo. So, co-creation at work by the Fox family.

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<sup>1</sup> “Een betere wereld begint bij inkoop”, interview Fredo Schotanus, Deal!, September 2022, p.16-19.

<sup>2</sup> Vos, B. (2004). Samen dansen op de vulkaan: De rol van inkoop in dynamische supply chains. Intreerede Universiteit van Tilburg, 10 september 2004.

<sup>3</sup> Victor Verboeket (2022), “Boosting innovation: Digitalization and co-creation towards sustainable and resilient supply chains”. Inaugural speech, Fontys Venlo, June 23, 2022.

The second core concept underlying this address is the power of metaphors. In general, I love to use them in my teaching and speeches. More specifically, the inspiration for the title of my lecture today comes from the seminal book of Gareth Morgan, *Images of Organization*<sup>4</sup>. I was introduced to this book when I started in Tilburg in 1995, two years after completing my PhD at Eindhoven University of Technology. Morgan’s book immediately intrigued me, and still does so today. In essence, Morgan describes eight metaphors, each providing a different perspective on organizing operations, I will briefly outline five of them later on. Why? Well, I feel these metaphors can be very useful to understand both the potential and the challenges in our journey to make supply chains more sustainable. In case you still wonder why that is needed in the first place, let me give you two illustrations.

The first one is the Earth Overshoot Day phenomenon, a construct introduced about fifty years ago. It marks the date when humanity’s demand for ecological resources and services in a given year exceeds what Earth can regenerate in that same year. Mankind “maintains” this deficit by liquidating stocks of ecological resources and accumulating waste, primarily carbon dioxide in the atmosphere. In 2022, Earth Overshoot Day landed on July 28, when the measurement started in 1971 this was still close to Christmas (see Figure 1). And this is the global average, there are huge differences amongst countries. The organizer of this year’s World Soccer championships, Qatar, has the questionable honor to be the country with the earliest overshoot day this year, early January. One may argue “well we are still alive and kicking” and literally speaking that is true. Still, this overshoot day concept is an alarming indicator of the limits to economic models purely based on growth.

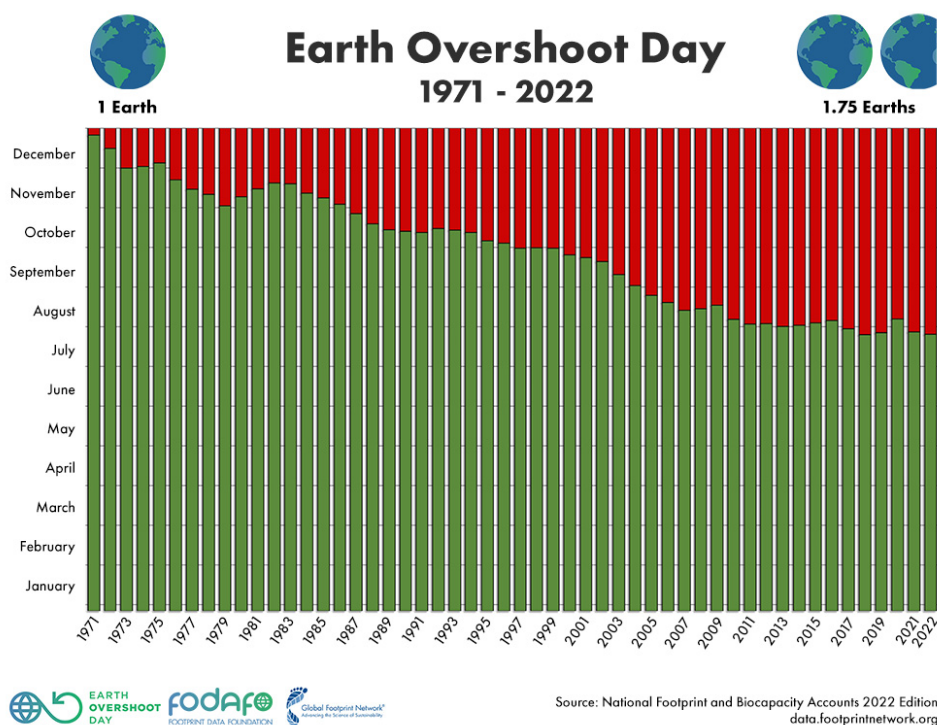


Figure 1: Earth Overshoot Day 1971-2022  
Source: *National Footprint and Bio-capacity 2022 edition*

<sup>4</sup> Gareth Morgan, *Images of organization*, 2006 (updated edition), Sage Publications.

The second example comes from an authority when it comes to issues related to our Planet Earth, Sir David Attenborough<sup>5</sup>. In his fascinating book, he uses some Key Performance Indicators (KPI's) related to the health of our planet. Well, he doesn't really call them KPI's, but we supply chain nerds would label them as such. As an eleven-year old boy, back in 1937, Sir David already loved to explore the British countryside on his bike, excited to discover fossils of sea animals hidden in stones. In those days, the world population was 2,3 billion, the carbon level in the atmosphere 280 parts per million (ppm) and the percentage of wild nature equaled 66%. Over eighty years later, in 2020, these figures are respectively 7,8 billion, 415 ppm and 35%. And the United Nations predicts that our world population will hit the 8 billion milestone later this year.<sup>6</sup>

	<b>World population (billion)</b>	<b>Carbon level (parts per million)</b>	<b>Percentage of wild nature (%)</b>
1937	2,3	280	66
1954	2,7	310	64
1960	3,0	315	62
1968	3,5	323	59
1978	4,3	335	55
1989	5,1	353	49
1997	5,9	360	46
2011	7,0	391	39
2020	7,8	415	35

Figure 2: World population, carbon level and percentage of wild nature development  
*Source: Data from David Attenborough, A life on our planet (2020)*

<sup>5</sup> David Attenborough (2020). Een leven op onze planeet. Uitgeverij Luitingh-Sijthoff

<sup>6</sup> The growth of the world population can be tracked via [www.worldometers.info](http://www.worldometers.info)

Obviously one can quarrel about the rationale for precisely these indicators and their definition, but the deteriorating long-term trend is clear. So, Sir Attenborough must be a very pessimistic, worried person? Well, I would almost say on the contrary, he actually is optimistic that we as “homo sapiens” (albeit one can cast some doubts about the sapiens part.....) can still visualize and realize a healthy planet for future generations. To make this happen, we “only” need the willpower to do so. In this spirit, I intend to sketch some pathways how our supply chain management domain can contribute to this global challenge.

### ***Structure of inaugural address***

How will I do that? Well, the structure of this address is like a dinner with five courses, hopefully for you I am able to serve this in an enjoyable and inspiring way. And you can of course enjoy Luuk’s visuals.

This introduction serves as a starter, followed by the first main course, a description of some images of supply chains. In the interest of time, I will limit myself to five of Morgan’s set of eight metaphors.

Next, it is time for an intermezzo, in dinner terms this would be a spoon. This is also the course where I would like to create some interaction with you as an audience. Don’t be afraid, it won’t hurt, I just want you to reflect on some daily life decisions.

After the spoon, it is time for the second main course, which I would like to label as fusion cooking. The idea is to apply Morgan’s rather abstract images to concrete examples of ongoing BISC projects.

Finally, there is of course a dessert. This will cover some concluding reflections and words of thanks. The latter will take some time since doing an inaugural address at the age of 58 implies that it can almost be seen as a farewell speech as well. And oh, I may have an answer to an until now unresolved riddle from the music world at the end.

### ***Supply chain as a machine***

Let's start the first main course with the first image, a supply chain as a machine. This is probably the most well-known one, with Charlie Chaplin's classic 1936 movie "Modern times" as iconic example. In one of the movie's most famous scenes, Chaplin gets stuck in a giant machine, throwing the entire factory into chaos. The workers' stress due to highly repetitive work is a major downside of a classical focus on making supply chains more efficient, organizing all activities like a clockwork, or to use another metaphor, a perfect relay race. All hand-overs between parties involved go smooth, we are fully in control, control, control, of course until a breakdown like the one shown in Modern Times occurs.

That movie is of course old, yet we still see a lot of examples of this machine metaphor around us, not only in manufacturing settings, like for example the car industry, but also in service environments. I would like to take a fast-food restaurant as an example from Morgan's book.<sup>7</sup> All activities are planned in a meticulous way, even the ones that involve personal interaction. Employees are trained to interact with customers based on detailed sets of instructions and also monitored in their performance. So service with a smile? That could indeed very well be the case, but most likely one that is driven by corporate policies and rehearsed to generate "authentic" results.

It will be clear that the machine metaphor has its limitations, especially in a VUCA world. A predominantly mechanistic supply chain can still work fine in stable times, to quote the famous mantra by Henry Ford about his model T in 1909: "you can order any color as long as it is black".<sup>8</sup> In more turbulent times this mantra will not hold anymore. So time to introduce a second metaphor, a supply chain functioning like an organism.

### ***Supply chain as an organism***

Let's ponder about an ideal world for a while, just use your imagination, or visualize as our coach of the Dutch national soccer team Louis van Gaal would call it! Wouldn't it be great if our supply chains are fully aligned with the needs of the environment it operates in, like a chameleon. Well, not if you are a big fan of bureaucracy, but especially in the high-tech industry this actually already is the name of the game.

That is what we conceptually label as contingency thinking, simply said there is no best, machine-like way of operating, it all depends on the needs of the relevant environment. It is about realizing the best possible fit between a supply chain's output and its demand, also in view of changing circumstances. This image borrows a lot from biology and ecology, building on Darwin's evolution theory notion that ultimately the strongest supply chain will eliminate the weaker ones. Coming from the Eindhoven region, I would like to use the story of ASML as illustrative example. This high-tech giant started less than 40 years ago, in 1984, one year after the introduction of the first mobile phone, as a spin-off from Philips, specializing in the development and manufacturing of advanced systems to produce computer

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<sup>7</sup> Gareth Morgan, *Images of organization*, 2006 (updated edition), Sage Publications, p.13-15.

<sup>8</sup> Henry Ford in collaboration with Samuel Crowther, *My Life and Work*, 1922, p72-73. Based on production data, the volume went from thousands per year in 1909 to millions per year by the mid 1920's.

chips. Currently it is the world's largest supplier of such systems primarily for the semiconductor industry and the sole supplier of advanced extreme ultraviolet lithography (EUV) machines. ASML employs over 31,000 people across the globe and from a supply chain perspective it relies on a huge network of more than 4,600 so-called first tier suppliers. This is an impressive performance in a highly competitive industry, reflecting ASML's innovative capabilities enabling them to outperform competitors like Canon and Nikon in satisfying the needs of their very demanding customers.

Like all metaphors, the organism one has some limitations, one being the danger that this becomes an ideology, serving as normative guidelines for shaping practices. As Morgan describes in his chapter on an image I will not discuss in detail today, the one on culture, organizations operating in supply chains can be seen as socially constructed phenomena. There are many hard, material assets in our supply chains, examples being machines, buildings and IT systems, but at the end of the day the difference is typically made by human beings. In other words, it is about the human touch, as put forward in the inaugural address of my colleague professor Leentje Volker of Twente University.<sup>9</sup> So, time to introduce a third image, the brain, representing the power of information processing.

### ***Supply chain as brain***

The brain image is in essence based on the idea that our "grey cells"<sup>10</sup> are in fact an information processing system. Needless to say that this is vital in a VUCA world. Double-loop learning mechanisms are needed since these involve the questioning of what existing norms are appropriate. This is actually the idea behind the Japanese concept of Kaizen, focusing on continuous improvement. This may sound logical, yet it does require an organizational mindset actively encouraging learning and change. Kaizen aims to institutionalize the challenging of taken-for-granted norms and practices, stimulating our creativity and often requiring our brains to develop new mindsets.

And our human brains increasingly are supported by advanced IT, resulting from enormous progress in the field of information management. All these digital tools can be seen as extensions of our human brain, hence increasing our information processing capabilities.<sup>11</sup> I will discuss some applications of digital tools in the second main course of this address, using examples from ongoing BISCO projects. It is, however, important to stress the support nature of these tools. In this sense, I follow the reasoning of my colleague professor Jan Fransoo in his recent inaugural address at Tilburg University.<sup>12</sup> He stated that the role of humans in supply chain decision-making is still very much alive, with humans making use of systems rather than the other way around.

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<sup>9</sup> Leentje Volker, "Just a little bit of that human touch: Towards a value-based ecosystem for delivering infrastructure services", inaugural address Twente University, November 21, 2019.

<sup>10</sup> To paraphrase Agatha Christie's famous Belgian detective, Hercule Poirot.

<sup>11</sup> Fascinating examples in our supply chain domain are Artificial Intelligence (AI), Virtual Reality (VR), robots, and block-chain technology.

<sup>12</sup> Jan Fransoo, Rebalancing operations and supply management: Models, data, and humans. Inaugural address, Tilburg University, September 23, 2022.



### *Supply chain as a psychic prison*

The alternatives to the classic machine metaphor, the organism and the brain, discussed so far are predominantly positive from the perspective of making fundamental transitions happen. It is now time to introduce two more gloomy images, starting with the psychic prison. This idea originates from Plato's allegory of the cave where Socrates addresses the relations among appearance, reality, and knowledge.<sup>13</sup> Let me try to give a brief description of this allegory. It pictures an underground cave with a burning fire and inmates being chained preventing them to move. Their reality is created by the shadows on the walls of the cave, talking about them and probably even linking sounds from outside with movements on the wall. In the words of Elvis Presley, they are caught in a trap they can't get out.<sup>14</sup>

What would happen if one of the inmates is allowed to leave the cave? Well, Socrates argued that he would see that the world out there is far more complex than the shadowy world inside. Still, when returning to the cave, it is very likely that his fellow inmates will not accept this other view of reality. They may actually see this outside world as a dangerous place, or even fooling or acting hostile towards the messenger of this news. Translating this to corporate life, this image implies that organizations become trapped by constructed perceptions of reality, making it difficult to change.<sup>15</sup>

In this respect, especially the link with the theory of transitional phenomena is relevant. The underlying idea is that in order to make a change "stick", humans frequently need time to reflect about the value of new practices. In other words, what is the added value of a new way of working? You will most likely recognize this in your personal lives as well, I most certainly do! It is really not that easy to abandon old habits or patterns.

Morgan provides a suggestion to support individuals or groups in making effective transition paths, the change agent.<sup>16</sup> In doing so, it is essential that such intermediates help organizations to let go what is dear to them before they can move on to a desirable new situation. This will require more from a change agent than merely selling a change package or a set of techniques. People involved in the change process, for example the journey towards more sustainable supply chains, should also be supported in internalizing this change.

Later on, I will provide some examples to illustrate that "our" BISCII can act as such a change agent. But let me first introduce my final image for today, the ugly face. And no, this is not a personal observation, but purely a professional one!

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<sup>13</sup> See Morgan, 2006, Chapter 7, p.207.

<sup>14</sup> Elvis Presley, *Suspicious Minds*, 1969.

<sup>15</sup> An interesting practical example in Morgan's book is about IBM missing the rise of a computer industry driven by software and networks (Morgan, 2006, p.209). The company IBM survived, but in 2005 its PC division was sold to the "new kid on the block" from China, Lenovo.<sup>15</sup> Rationally this was actually a logical business deal, Lenovo was already on its way to become a leading force in the global PC industry. But you can probably imagine the sentiments in the United States about one of their corporate icons being sold to a Chinese company.

<sup>16</sup> Morgan, 2006, p.229.

### ***Supply chain as ugly face***

By way of introducing my final metaphor, I would like to quote some lines of the obscure Fischer-Z song “Multinationals bite”, from the 1981 album with the gloomy title “Red skies over paradise”<sup>17</sup>:

*You don't realize  
The extent of their power  
I can't help you  
Anymore  
And you'll find out  
Multinationals bite bite bite  
They'll destroy you  
Overnight  
I hear war-drums (Picking up pieces of blood for you, now)*

Probably lead singer John Watts was not aware of it, but this is an almost perfect illustration of the Ugly Face image<sup>18</sup>, viewing organizations as instruments of domination. In doing so, Morgan pays explicit attention to the role of multinationals. I would like to stress that multinationals are not by definition “evil”, actually in the past decades more attention is paid to non-economic issues. The acronym often used is Triple P, people, planet, and profit.<sup>19</sup>

This address is not meant to name and shame individual companies, yet the sad and inconvenient truth is that multinationals often still put the (financial) bottom-line above ecological and social issues. As said, I don’t want to make this address too gloomy, yet this reality cannot be denied. It would be quite simple to fill the rest of this address with specific illustrations of this ugly face, but I limit myself to share some of Morgan’s more general reflections on this metaphor.

First of all, it is important to stress that this image can actually be seen as an extension of the political metaphor, think about the impact of different sets of interests, conflicts, and power in shaping activities in organizations. These dynamics are present everywhere, also in small and medium sized companies and universities, but are bound to be more pronounced in global settings. Next, some multinationals can truly be labelled as world powers, with market values that exceed the gross national incomes of many nations. Finally, this ugly face metaphor can be seen as a rather extreme form of left-wing ideology, fueling radical sentiments, thus further complicating the job of managers in a VUCA world. Still, as Morgan observes actually all images are inherently ideological, tending to give rather one-sided views.

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<sup>17</sup> Lyrics can be found on [FISCHER-Z - MULTINATIONALS BITES LYRICS \(songlyrics.com\)](https://www.songlyrics.com/fischer-z/multinationals-bites-lyrics/)

<sup>18</sup> The term “ugly face” was once introduced by the former British Prime Minister Edward Heath, referring to the negative impact that organizations often have on our world (Morgan, 2006, p.293).

<sup>19</sup> Since 1999 the famous US stock exchange index Dow Jones, has a sister/brother called Dow Jones Sustainability Index (DJSI). It would take too long to discuss this index in full detail, but in essence it is about assessing corporate economic, environmental and social performance. The underlying idea is to reject companies that do not operate in a sustainable and ethical manner.

### *Intermezzo: Daily life consumer decisions*

After introducing these images of supply chains, it is time for an intermezzo, starring my daughter Eline. Well, I actually take her as an example of an individual consumer, in her case a “poor” student, having to make difficult choices every day, like all of us.

I would like all of you to stand up. Thanks, now the idea is simple. I will give you three examples of choices Eline has to make on an almost daily basis, each with two answer options. For one answer you keep standing, for the other you can sit down. Please do not give politically correct or socially desirable answers, it is really about what you would do in that situation.

Clear? Okay, let’s start with the first choice. After waking up, Eline can opt for a cup of coffee or tea. Who fancies a cup of tea? Please keep standing, the coffee lovers can sit down.

In general a cup of tea is the more healthy and ecological-friendly choice, yet in reality this may not always be the case. It, for example, depends on the amount of water one boils to make one cup of tea, personal preferences and certainly also the specific brand, some being more sustainable than others. I will come back to challenges in global supply chains of agricultural products later on.

Next, Eline obviously also wants to stay healthy, so she wonders what fruit to take with her for her break later on. She is tempted to take some exotic mango pieces in the fridge, but she can also choose a classic Dutch apple.

Who opts for the mango? Please be seated, keep standing if you go for the apple.

In general, it makes sense to prefer the local option (the apple) over the imported one (the mango). Based on data from the Food and Agriculture Organization of the United Nations, one kilogram of apples requires 38 liters of water, 0.3 m<sup>2</sup> of land usage and causes 0,5 kg of CO<sub>2</sub> emissions. These data for one kilo of mango are respectively 370, 0,7 and 1,5, so purely based on these data it is clear what Eline should choose. However, again other factors, like personal preferences, are bound to influence final decision-making.

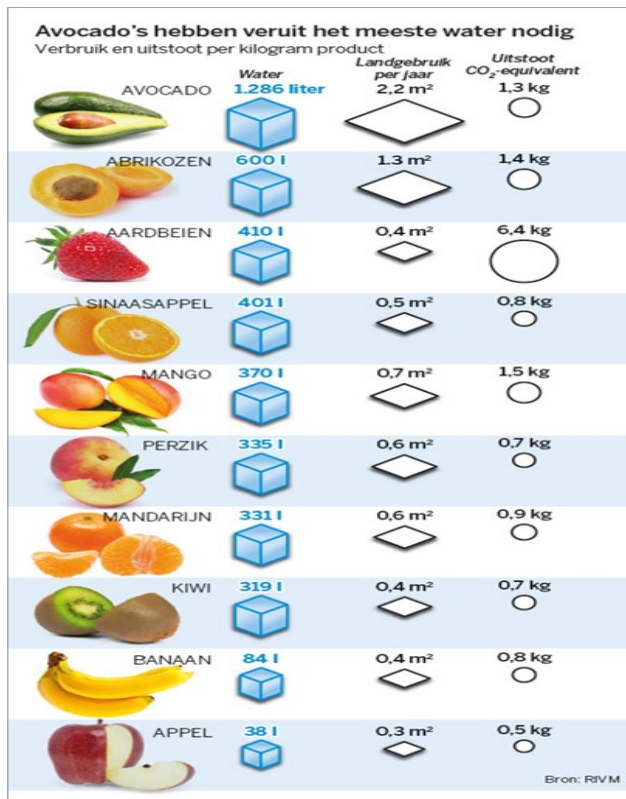


Figure 3: Water consumption, land usage and CO2 emissions for some fruits  
Source: Volkskrant, May 14, 2022

Time for the final choice in this intermezzo: how will my daughter go from her house in Eindhoven to her study location in Tilburg. Due to all the difficult choices she had to make in the early morning, Eline is already a bit late. So, what shall she do: take her mother's (regular Euro95) car or use her (free) student OV card (assuming that buses and trains are up and running, so not bothered by disruptions like strikes)?

Keep standing if you opt for the OV solution, sit down if you take the car and please remember: no socially desirable answers!

For those still standing, I add some additional information: Eline has a really important exam, does that change your opinion? If so, you can sit down.

From a CO2 emission reduction perspective, Eline should for sure opt for the OV solution, for her as a student it is even for free! Still, if it concerns something really important, like an exam, the car may actually be the preferred alternative.

Thanks for engaging in this experimental intermezzo, those "sustainable heroes" still standing can be seated again. Morale of this spoon? It is not easy to be green to quote Muppet Kermit the Frog, or more generally to make sustainable choices. Moreover, it is virtually impossible to be perfect in everything we do. I would once more like to refer to a recent interview with my colleague Fredo Schotanus. He states that at home they have become more conscious, for example by taking public transportation or bicycles as much as possible and by not eating meat every day. Still, Fredo is honest in stating that he is not "more roman than the pope" and I think that applies to most of us, it does most certainly for myself.

And trade-off challenges do not only apply to individual consumers, but also to corporate decision-making. I found an interesting example in a recent interview in the Dutch newspaper Trouw with Albert Heijn (AH)'s director of quality and sustainability. AH pays a lot of attention to sustainability in both its operations and its product range, trying to persuade customers to make sustainable choices in their shopping behavior. Still, AH faces a lawsuit by the Dutch non-governmental organization (NGO) Milieudefensie since the company is seen as one of country's bigger polluters in terms of CO2 emission. This would of course not be very positive for AH's image and reputation. However, in the interview the company's head of quality and sustainability rightfully states that "it is not only about CO2 impact, but also about issues like deforesting, biodiversity, water quality, and human rights"<sup>20</sup>. As said, this range of sustainability issues makes trade-offs virtually inevitable.

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<sup>20</sup> "Albert Heijn wil klanten 'maximaal verleiden' to duurzame keuze", interview Anita Scholte op Reimer (Albert Heijn), Trouw, 1 Oktober 2022, p. 22=23.

## ***BISCI introduction***

Time for the second main course. I can imagine that the images I “served” earlier are quite abstract, I will now discuss some concrete examples of BISCI projects. I hope these examples illustrate how our institute can be a change agent in making supply chains more sustainable. But let me first give a short introduction of BISCI, the Brightlands Institute for Supply Chain Innovation, officially started on the Greenport Campus in Venlo on September 1, 2019. We started with a core team of five persons, by now we have a team of over thirty professionals from our partner organizations Maastricht University, Fontys Venlo and TNO. Moreover, we acknowledge the support from the Province of Limburg, not only by providing a so-called kennis-as subsidy, but also by an active role in various projects.

These projects should fit with our mission to develop and realize smart and sustainable supply chain innovations. We do so by orchestrating resources and expertise from knowledge institutions, industry and governments, nowadays referred to as the Triple Helix. In essence, BISCI is about building bridges, to use another metaphor, in the spirit of Roman water management over 2000 years ago. Aqueducts like the Pont du Gard can be seen as examples of extraordinary supply chain innovations.<sup>21</sup> BISCI aims to build “bridges” between Triple Helix parties to realize societal impact via knowledge development, transfer and implementation. As said, we do so with a team of over thirty professionals, but we can also benefit from the contributions from our Fontys Venlo and Maastricht University students.

Just over three years after our launch, the BISCI portfolio consists of a couple of dozen projects in different industries and regions. I will now give three examples of BISCI projects aimed at making supply chains more sustainable. I would like to stress that this is my personal reflection on these projects.

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<sup>21</sup>The Pont du Gard is UNESCO World Heritage, see [Pont du Gard \(Roman Aqueduct\) - UNESCO World Heritage Centre](#)

### *Healthy Primary School of the Future project*

The first example is about our involvement in the Healthy Primary School of the Future initiative, with a leading role by my colleague Victor Verboeket, lector Supply Chain Innovation at Fontys Venlo.<sup>22</sup> Financially a small project in our portfolio, but one with considerable societal relevance and impact.

The idea behind this initiative is quite straightforward: make young children familiar with a healthy lifestyle and they will take that style with them while growing up. A more indirect effect is that people in the children's environment, like parents and other family members, are also positively affected by this lifestyle.<sup>23</sup> It started with a pilot project involving free healthy lunches at four primary schools in Parkstad in the southern part of Limburg. The results of these pilots were very promising in terms of improving the participating children's health indicators like BMI. One of the remaining challenges concerns the costs of these lunches, partly caused by a quite complex supply chain to organize these lunches.

So, in our BISCOI-project, we developed an Excel tool to analyze the financial consequences of different supply chain designs, taking into account the wish to use local seasonal products as much as possible. The results increased our insights into the financial impact of parameters like the number of participating schools and the use of professional employees versus volunteers. Our analyses show that scale matters, especially when schools are geographically concentrated, and that the use of volunteers is (obviously) highly recommended from a financial perspective.

In terms of the images presented earlier, this project is almost a textbook example of the brain metaphor, involving the development of a tool to support human decision-making.<sup>24</sup>

The biggest hurdles to be overcome are bound to come from the culture and psychic prison metaphors. Now don't get me wrong, I am not labelling primary schools as psychic prisons, but introducing a new practice, in this case a healthy way of living, is bound to encounter opposition in the spirit of Plato's cave. In this sense, it is positive that since early 2022 a major Dutch retailer is responsible for the delivery of lunches to participating primary schools in Limburg. Schools order via a customized web portal, enabling them to have control over the required number of lunches in order to minimize the amount of waste. There are still child-diseases, like technical hick-ups, but retailer and schools work in close collaboration to fine-tune their supply chain.<sup>25</sup>

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<sup>22</sup> "Fontys ontwikkelt rekenmodel voor de gezonde basisschool voor de toekomst (GBT)", KennisDC Logistiek website, January 2022.

<sup>23</sup> As a side note, the Dutch government recently announced plans to provide free breakfasts for "vulnerable children" at around 500 primary schools ("Gratis ontbijt op basisscholen met veel kwetsbare leerlingen", NOS Nieuws, 4 Oktober 2022). This is a response to the current economic situation, with rising prices making it challenging for an increasing number of families to organize breakfast themselves. In turn, this has a negative impact on the learning results of children.

<sup>24</sup> Moreover, in this specific setting, there is room for improvement in the supply chain "machine" in which primary schools operate.

<sup>25</sup> See newsletter "Update oktober 2022, GBT groeit in Limburg". More information can be found on the website [De gezonde basisschool van de toekomst | De Gezonde Basisschool van de Toekomst: Van Leerschool naar leefschool](#)

## *Smart Packaging project*

Next, I would like to introduce our Smart Packaging project, with Tom Schiefer as PhD student and Robert Suurmond as co-supervisor. This project started early 2020 as part of a bigger consortium of knowledge institutions and companies. Smart packaging can be seen as a promising form of digital supply chain innovation, enabling detailed insights about products on a unit level and real-time updates on the status of these units. Being part of this research consortium, enables us to monitor the smart packaging implementation process in three different supply chains: high-tech, healthcare and food. This resulted in a rich longitudinal dataset consisting of interviews, focus group meetings, observations, and secondary data. Tom is still working on the analysis of these data as part of his PhD project, but the first results point at interesting differences between industries. The high-tech and health cases look promising, with functional prototypes being ready for ramping up in their supply chain operations. Ironically, the case with the highest potential for sustainability improvements, the food supply chain, is the one which was terminated about halfway our research project.

As a researcher, this results in mixed emotions. On the one hand, it is a pity that we could not complete the data collection and analysis process for this pilot project. On the other hand, it created an opportunity to execute an ex post evaluation on the rationale for terminating this project. In essence, the conclusion of this evaluation was that the participating food company had other strategic priorities for which they needed the capacity of the employees involved in our pilot. As such, this was understandable from a business perspective, since the smart packaging application would not be economically feasible in the short run. Still, this was known from the beginning of our project, so for the consortium it was disappointing that this pilot could not be completed. It would have been interesting to execute a small-scale test of this smart packaging solution with sensors to measure time and temperature of food products. In the supply chain between retailers and consumers, working with such dynamic expiration dates creates opportunities for preventing food waste.

From the perspective of Morgan's images, the results from our food pilot project demonstrate that smart technology extending our human brain's information processing capacity in itself is not sufficient to make supply chains more sustainable. I admit that this food case is not the ugliest of the ugly face metaphor, yet at the end of the day different interests led to the decision to terminate this pilot. I can only hope that such hurdles can be overcome, since in the food industry there is actually a profound need for innovative smart packaging solutions.<sup>26</sup> A recent launch of an innovative bottle with a smart cap by an American sports beverage manufacturer is promising in this respect, albeit serving a relatively small niche market.<sup>27</sup>

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<sup>26</sup> "IoT and the imminent supply chain digital transformation", Market Insights Report, p.21, Avery Dennison, July 2020.

<sup>27</sup> [Smart water bottle for athletes tells them when it's time to drink | Article | Packaging Europe](#). This bottle tracks personalized hydration needs of athletes, indicating when to drink via smart cap that lights up as an alert mechanism. Once users synchronize their smart bottle with a dedicated app, the individual's daily progress can be tracked via an array of sensors on the cap of the bottle. The company believes this innovative bottle will enable them to keep their brand at the forefront in its competitive industry. Drawbacks? Well, if athletes fancy hot tea or ice coffee that is a no-go since the smart bottles cannot deal with hot or extremely cold drinks.



### *Fair & Smart Data project*

The final BISCO project I would like to present today is our Fair & Smart Data (FSD) initiative, some of you may have attended the hybrid event prior to this inaugural address. The FSD project was launched in 2021 as one of our School's so-called spearhead projects, aiming to improve the living conditions of smallholder farmers in the so-called Global South<sup>28</sup>. The underlying idea is to use smart data technologies, new business models and good governance of global value networks as drivers for systemic change. Besides various entities of Maastricht University, we are very happy with and proud of the collaboration with our external partners Solidaridad<sup>29</sup> and Rabobank in the FSD consortium.

This ambitious spearhead project is really a long-term research journey, stretching at least until 2025. In the interest of time, I will now restrict myself to some general observations. Let me start by observing that in the current business reality of smallholder farmers, data does not seem to play an important role. Taking the perspective of the ugly face metaphor, farmers often are the lowest value receiver in the total global supply chain. Dominant actors higher up in the supply chain, like producers and retailers, primarily collect data for their own purposes, with farmers sharing these data without realizing their value.

Digital technologies can play a crucial role in creating 'smart' data to increase transparency and traceability throughout global supply chains for commodities like coffee and cacao. Smart data should eventually also become fair data assuring that smallholder farmers get properly rewarded for the value these data have for producers and retailers.

Sounds idealistic? Maybe so, but let me briefly share the experiences of one of our FSD researchers, Sidi Amar, joining colleagues from our partner Solidaridad in a recent field trip to Malawi.<sup>30</sup> Sidi could observe that the farmers in Malawi's rural areas are increasingly using digital tools in their activities. Solidaridad's digital advisor joining this field trip told Sidi that "ten years ago, I would've never thought this could happen!" So, the digitalization of small-scale farming opens many opportunities to smallholder farmers in Africa and other Global South regions, enabled by improvements in the ICT infrastructure. However, the extended "brain capacity" alone may not be enough to address prevailing power imbalances in global value chains. Hence, I can fully relate to Sidi's final statement in his blog: "How can we make the situation better for smallholder farmers? We have the knowledge, the technology, the finance, and the needs, so what is the missing link?" Our FSD spearhead may not result in THE answer to this fundamental question, but I am convinced that our ongoing research will yield valuable results in this respect.

I am fully aware that this short FSD description doesn't do justice to the richness of ongoing research in this spearhead. Still, this project is precious to me for both personal and professional reasons. On a personal level, my interest in challenges of the Global South was actually the main reason to start studying Industrial Engineering and Management Science in Eindhoven back in 1982, eventually resulting in my master thesis project for a drinking water company in Indonesia in 1987. From a professional perspective, FSD fits our BISCO mission

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<sup>28</sup> The Global South includes countries in Africa, Latin America, and developing parts of Asia and the Middle East. Alternative terms are Third World or developing countries.

<sup>29</sup> See Solidaridad website [What fair and smart data means for farmers - Solidaridad Network](#)

<sup>30</sup> Blog Sidi Amar, "How digital tools can give farmers in Malawi their fair share", FSD website, June 24, 2022, [News - Research - Maastricht University](#)

like a glove, aiming to develop and implement smart and sustainable supply chain innovations. Hence, I would like to encourage you to keep tracking progress of our FSD Spearhead.<sup>31</sup>

### *Concluding reflections*

Time for the dessert in my dinner metaphor, starting with some concluding reflections.

First, sustainability is a complex, multi-faceted phenomenon. This is also reflected in the title of the recent inaugural address of my UM colleague Yvonne van der Meer: “How sustainable is it? That is the question”.<sup>32</sup> As you can imagine, there is no uniform answer to that question, not in Yvonne’s field of chemicals and materials, let alone in a broader context. The sustainability journey is bound to be industry and firm specific, as we could already see in the smart packaging project. Conceptually, the 17 Sustainable Development Goals (SDGs) of the United Nations can be a useful capstone to set such priorities (see Figure 4).<sup>33</sup>



Figure 4: Sustainable Development Goals (SDGs) United Nations

Source: [THE 17 GOALS | Sustainable Development \(un.org\)](https://www.un.org/sustainabledevelopment/)

Of course these goals are still quite broad, yet each SDG is further broken down in specific targets. For the supply chain management domain in general, SDG12 is most relevant given its focus on responsible production and consumption. Other generically relevant SDGs are 9 (industry, innovation and infrastructure) and 17 (partnerships for the goals). Our FSD

<sup>31</sup> See [Fair and Smart Data - the Currency for Global Sustainability - Research - Maastricht University](https://www.maastrichtuniversity.nl/research/fair-and-smart-data-the-currency-for-global-sustainability)

<sup>32</sup> Prof.dr. Yvonne van der Meer, How sustainable is it? That is the question. Inaugural speech, Maastricht University, June 2021.

<sup>33</sup> [THE 17 GOALS | Sustainable Development \(un.org\)](https://www.un.org/sustainabledevelopment/)

consortium is actually a good example of a multi-stakeholder partnership. The relevance of other SDGs is as said industry and firm specific.<sup>34</sup>

Next, for me it is clear that transition paths to more sustainable supply chains should move away from the traditional, efficiency driven machine image. In doing so, the organism and brain metaphors can be guiding principles to make this happen, benefiting from the progress made in the information management domain. Still, the ugly face and psychic prison metaphors are bound to act as “spoilers” in this transition process.

For me the outcome of this “battle of the images” should be obvious, especially if Sir David Attenborough is right to trust the brains of Homo Sapiens. Still, when looking at the Earth Overshoot Day trend, one can doubt our capabilities to make fundamental changes happen. Our economic models are still predominantly growth-driven, hence denying the boundaries of our planet.<sup>35</sup>

Finally, to end this reflection on a more positive note and as a sort of bridge to my words of thanks, I would like to ask your attention for the beautiful Dijk song “Kan ik iets voor je doen”, translated as “Can I do something for you”. In my opinion, the idea behind this song is applicable in both our private and professional lives. Small actions or gestures can really make a big difference for the receiving party. In other words, the human touch once more, but in a different way.

### *Words of thanks*

Reaching the end of my address, as promised I would like to thank some people. The efforts of supply chain organizations to become more sustainable can be seen as a journey and that actually applies to my career as well. I am grateful for the support I got from many co-creators along the way. I will mention a few, while acknowledging the support of many more, and will switch to Dutch for this final part.

Uiteraard wil ik beginnen met mijn ouders. Ze zijn er helaas niet meer bij, dit is wat ik in mijn intreerede in 2004 het “Niemand in de Stad” gevoel noemde<sup>36</sup>. Net als bij liveoptredens van De Dijk is mijn lijstje van dierbaren die ons ontvallen zijn alleen maar langer geworden. Ik ga ervanuit dat onder aanvoering van ons mam het daarboven vandaag ook wel een feestje zal zijn.

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<sup>34</sup> In this respect, I find it encouraging that annual reports of multinationals like Unilever, ASML and Philips pay explicit attention to the link between relevant SDGs and their business strategies.

<sup>35</sup> The plea for fundamental, transformational supply chain changes also echoed in a key note speech at the European Operations Management Association (EurOMA) conference this summer in Berlin. Professor Jeremy Hall of the influential British Science Policy Research Unit postulated that fighting the climate crisis requires radical innovations building on new business models and policy interventions. In his speech he gave three examples of negative emissions technologies, so it can be done, albeit it still seems to be the exception rather than the norm. See: Jeremy Hall, “The challenges and opportunities of emerging technologies addressing the climate crisis: Towards transformative sustainable supply chains”, keynote speech EurOMA conference, Berlin, July 2022.

<sup>36</sup> Vos, B. (2004). Samen dansen op de vulkaan: De rol van inkoop in dynamische supply chains. Intreerede Universiteit van Tilburg, 10 september 2004, p.60.

Vervolgens was mijn studie- en promotieperiode aan de TU in Eindhoven van groot belang voor mijn verdere loopbaan. In 2004 ben ik al ingegaan op de cruciale rol van mijn “Doktorvater”, de helaas veel te jong overleden Toon van de Ven. Vandaag wil ik ook Dick van Damme en Sander de Leeuw expliciet noemen; samen vormen we het trio promovendi van onze wijlen promotor Ploos van Amstel, echt super dat jullie er vandaag ook bij zijn.

Daarna volgde een periode van ruim 20 jaar Universiteit van Tilburg. Ik heb ik in die periode in Tilburg vele rollen vervuld, het is onmogelijk om hier alle collega's te noemen waar ik mee samen heb mogen werken. Een paar mensen verdienen echter een bijzondere vermelding. Daarbij wil ik beginnen met Arno de Schepper; Arno, jij hebt een beslissende rol gespeeld bij mijn aanstelling als NEVI-hoogleraar in 2003, maar daarnaast hebben we vele jaren samen logistiek & inkooponderwijs mogen verzorgen. Dat deden we met ons eigen boek Dynamiek in Logistiek, uiteraard samen met onze onvolprezen coauteur Freek Aertsen. Rijk zijn we er niet van geworden, maar we hebben wel veel lol gehad. Super dus dat je er vandaag met Joke bij bent, uiteraard geldt dat ook voor Freek en Lizet.

Vervolgens wil ik ook mijn Tilburgse collega's Wendy van der Valk, Henk Akkermans en Bert Meijboom bedanken voor de prettige professionele samenwerking in vele projecten, maar vooral voor jullie vriendschap. Fijn dus dat jullie er vandaag bij zijn.

Dan is het tijd voor het hier en nu. Ruim drie jaar geleden verruilde ik Tilburg dus voor Maastricht, of beter gezegd: ik ben feitelijk “verleid” door mijn huidige collega's Gaby Odekerken-Schroder en Frank Rozemeijer. Overigens had ik aanvankelijk helemaal niet door dat ze mij voor BISC I wilden hebben! Dank Gaby en Frank voor het vertrouwen en de nog voortdurende samenwerking.

Dat geldt uiteraard in algemene zin voor de collega's binnen het departement Marketing & Supply Chain Management. Ins besondere mochte ich gern Dominik Mahr bedanken. Du bist nicht nur unser Head of Department, aber auch sehr wichtig für mich persönlich.

En natuurlijk moet ik onze secretaresses Nicole en Pascalle noemen. Mede dankzij jullie voelde deze Brabo zich welkom in Limburg, ook toen we al vrij snel na mijn komst te maken kregen met een cyberaanval en de corona pandemie.

Dat maakte het opstarten en uitbouwen van BISC I ook niet bepaald makkelijker, maar zoals ik al eerder zei is dat best aardig gelukt. Heel veel dank dus voor mijn mede “BISC Ianen” van het eerste uur: Ton, Kars, Tom en Nicole Gooren en zeker ook voor Nick Bos. We hebben jouw steun vanuit het College van Bestuur altijd gevoeld. Vooral Ton Geurts heeft als onze business directeur een cruciale rol gespeeld bij het uitbouwen van onze projectenportfolio. But of course I would like to thank the entire, truly international BISC I team we have today, we really make it work together. I would especially like to thank Grant and Shreyas for their fantastic work in keeping the “BISC I machine & brains” going.

Verder ben ik de trotse programmaleider van onze Master Global Supply Chain Management & Change in Venlo. Recent hebben we voor deze opleiding een gouden medaille van Elsevier mogen ontvangen en ook dat is uiteraard teamwerk. Tjark, ik herinner me onze eerste ontmoeting in (of all places!) de stationsrestaurant van Eindhoven nog heel goed. Binnen een paar minuten hadden we door dat we allebei een groot onderwijshart hebben, ik ben dan ook blij dat je nog steeds deel uitmaakt van Team Global. Dat geldt zeker ook voor mijn overige

docenten en de collega's van Campus Venlo. Vanaf het begin heb ik me heel welkom gevoeld in de Nassaustraat, dank daarvoor.

Tja, en dat onderwijs doen we natuurlijk voor onze studenten. Ik prijs mij gelukkig dat ik in Eindhoven, Tilburg en Venlo met vele honderden, vermoedelijk zelfs duizenden studenten heb mogen samenwerken. Voor mij blijft het fantastisch om een bijdrage te kunnen leveren aan het leerproces van jonge mensen binnen ons vakgebied, dat hoop ik nog een aantal jaren te blijven doen.

Een speciale groep van "studenten", zelf zie ik ze meer als collega's, wordt gevormd door mijn promovendi. Veel dank dus Mark, Jeroen, Mieneke, Petra, Feng en meest recent Pauline voor de samenwerking. Tom gaat de laatste fase van zijn promotiereis in, Lonneke en Hannah zitten nog in de startfase.

En dan kom ik nu bij voor mij heel belangrijke mensen in mijn privé omgeving. De laatste jaren waren voor mij niet altijd makkelijk en wat is het dan fijn om een groep echte vrienden/vriendinnen te hebben. Recent las ik in een artikel dat de mooiste vriendschappen vaak gedurende lange tijd gerijpt zijn<sup>37</sup>, dat kan ik bevestigen. Ik ga niet iedereen noemen, maar "da gullie bedankt zeit da witte".

Verder natuurlijk mijn kinderen Luuk, Nienke en Eline. Vandaag heeft iedereen kunnen genieten van de fantastische plaatjes van Luuk en straks de muziek van Nienke, maar uiteraard ben ik een trotse papa van jullie alle drie en ook superblij met Hilde, Kevin en Arend. De momenten samen worden minder nu jullie je eigen pad kiezen, en zo hoort het ook, maar in de geest van De Dijk geldt wel "groots zijn de momenten waar het allemaal om gaat".

En dan "Wat een vrouw niet kan doen" Marja! We kennen elkaar pas een paar maanden, maar het voelt al zo ontzettend vertrouwd. Ik had niet verwacht dat dit geluk nog op mijn pad zou komen en daar mogen we mijn Fontys collega Viktor Verboeket en zijn vrouw Maud voor bedanken. Zij zagen de match, weer een voorbeeld van de human touch, daar kan wat mij betreft geen Tinder of First Dates tegenop!

And now REALLY to conclude, as announced at the start, I am going to answer the riddle included in a song by the Norwegian one-hit wonder duo, Ylvis. Since its release in 2013, their song got over 1 billion views on You Tube, quite impressive I would say. But almost a decade after the release of this Norwegian surprise it is about time to answer their question: What does the fox say?

Well, this Fox says..... Ik heb gezegd!

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<sup>37</sup> Caitlin Stoker, "Hé, zullen we vrienden worden?", FD Persoonlijk Magazine, 22 oktober 2022.