

# VISUALIZE AND ANALYZE COMPLEX CHALLENGES THE EASY WAY



# CONTENT

- Consideo's mission "What to do within 90 minutes"
- The tool's qualitative and quantitative features
- Lingua franca of cause and effect relations (no difference between CLD and S&F)
- Descriptive vs. explorative modeling
- Exercise: How to start a model (KNOW WHY Method)
- Exercise: Bionic principles
- Exercise: Weighting of connections
- Exercise: Insight matrix - beyond Fuzzy Cognitive Maps
- Exercise: categories, filters, attributes, presenter, ....
- "Basically, all models are wrong"
- Munich Airport example
- IAM example followed by D3
- Examples from KNOW-WHY.NET
- Your questions




# CONSIDEO

- Spin-Off of an EU research project to provide a tool as easy as Power Point or Excel
- A decision support within 90 minutes
- It's not the tool alone, "it's the psychology, stupid"

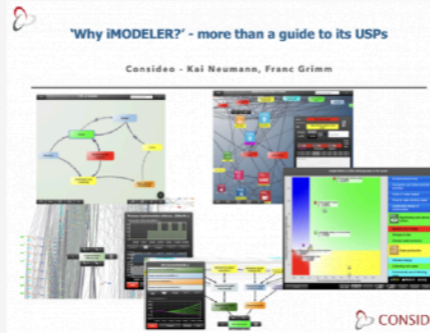
The screenshot shows the CONSIDEO website interface. At the top, there is a navigation menu with links for iMODELER, Software, Background, Applications, Dates, and News/Contact. Below the menu are five main categories: Videos, Books, Papers, Free Models, and Online-Shop. The 'Papers' section is highlighted, showing two entries:

**Papers**  
Consideo White Papers, Articles etc.

---

 Luebeck, 14.06.2023  
**Grey series - part 10: The GLU Model - Can we feed the world and survive it?**  
**Authors: Kai Neumann and Franc Grimm**  
Abstract:  
A simulation model to explore our chances to feed the world without continued deforestation.  
[Here you can read the paper:](#)

---

 Luebeck, 08.11.2022  
**Grey series - part 9: Why iMODELER - a guide to its unique features**  
**Authors: Kai Neumann and Franc Grimm**  
Abstract:  
The iMODELER is probably the leading software to visualise and analyse interconnections. We can collect arguments around our challenges and directly translate them into cause and effect relations.  
[Here you can read the paper:](#)



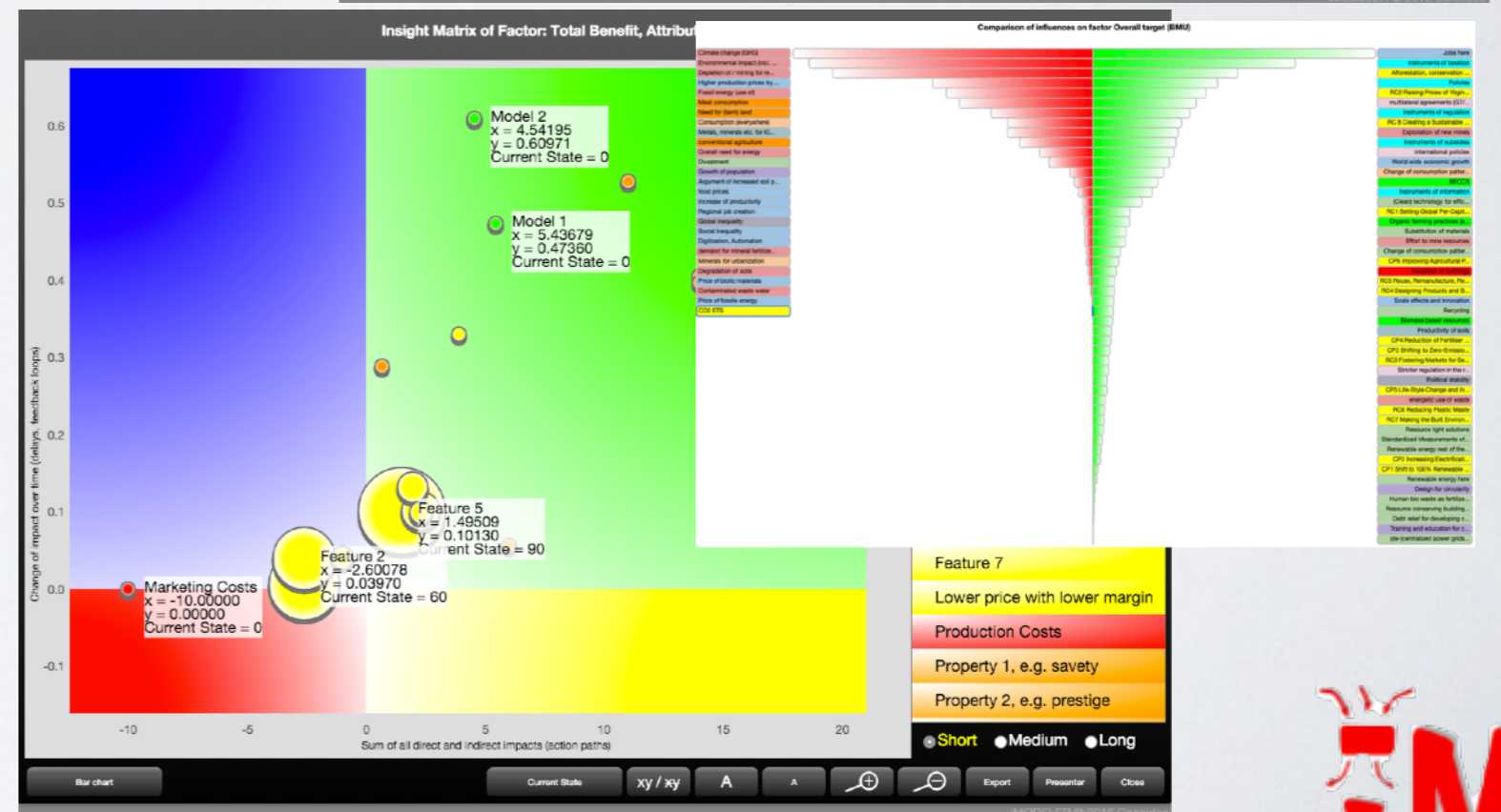
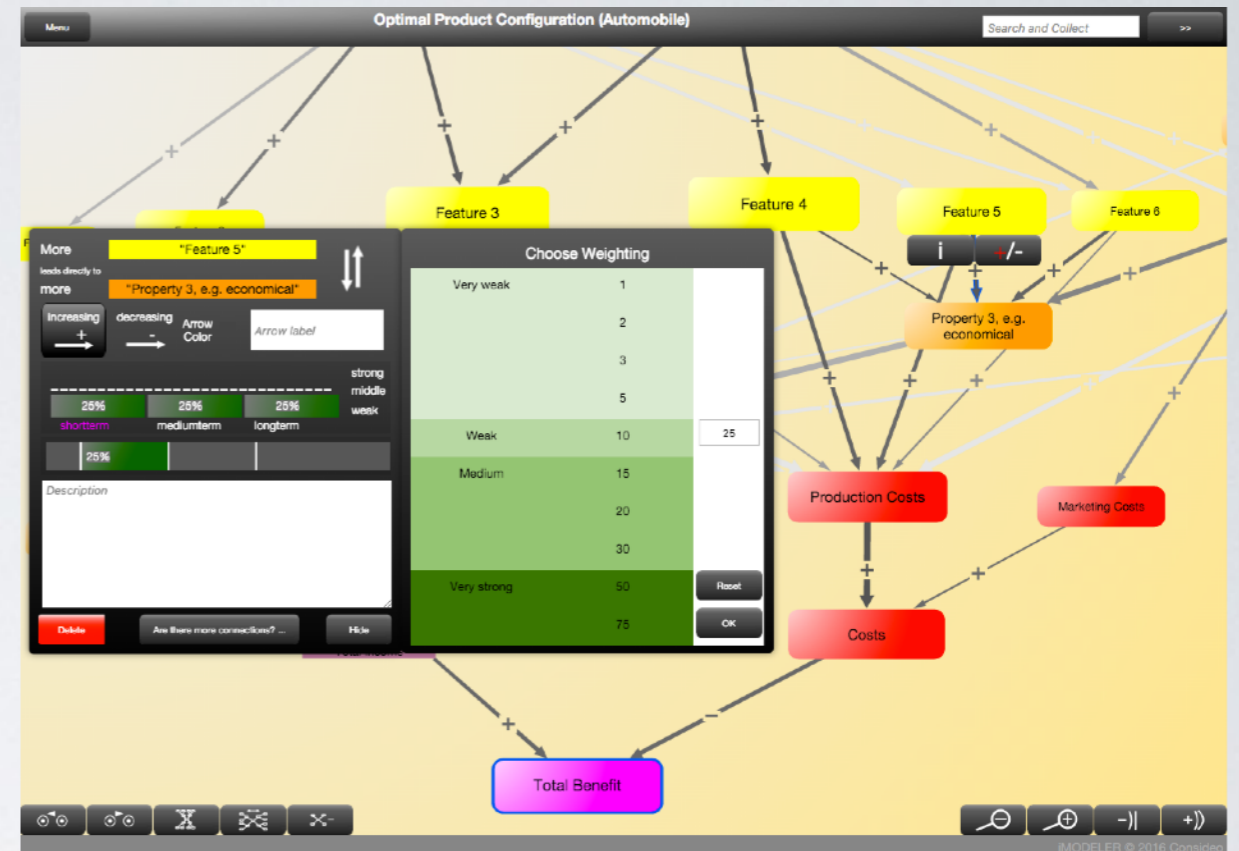
# TACKLING COMPLEX CHALLENGES WITH THE HELP OF THE iMODELER

- Qualitative modeling, quickly identifying what needs to be done looking at the Insight Matrices.
- Quantitative modeling, easily seeing from scenarios how something is probably developing (Monte Carlo).
- Process/project modeling, easily seeing how a process or project can be optimized (ToC and OR).
- Powerful collaborative modeling and model sharing directly via link without additional licenses.
- Models with thousands of factors using filters, clusters, and change of perspective (bionic principle).
- Data integration (Excel, csv, ....).
- KNOW-WHY.NET to get proposals for additional influence factors from the collective intelligence of a community.
- .....and a lot more ....



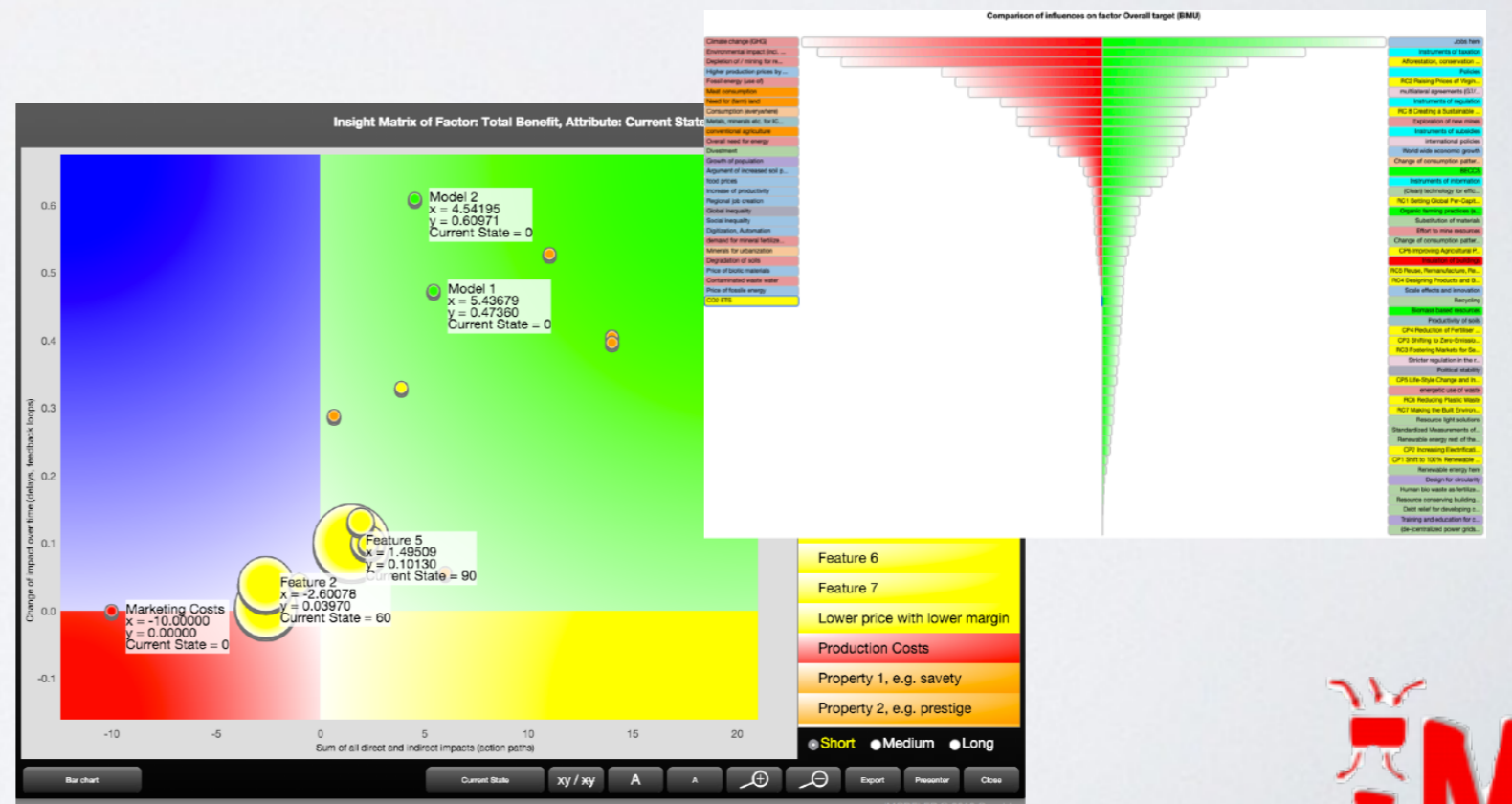
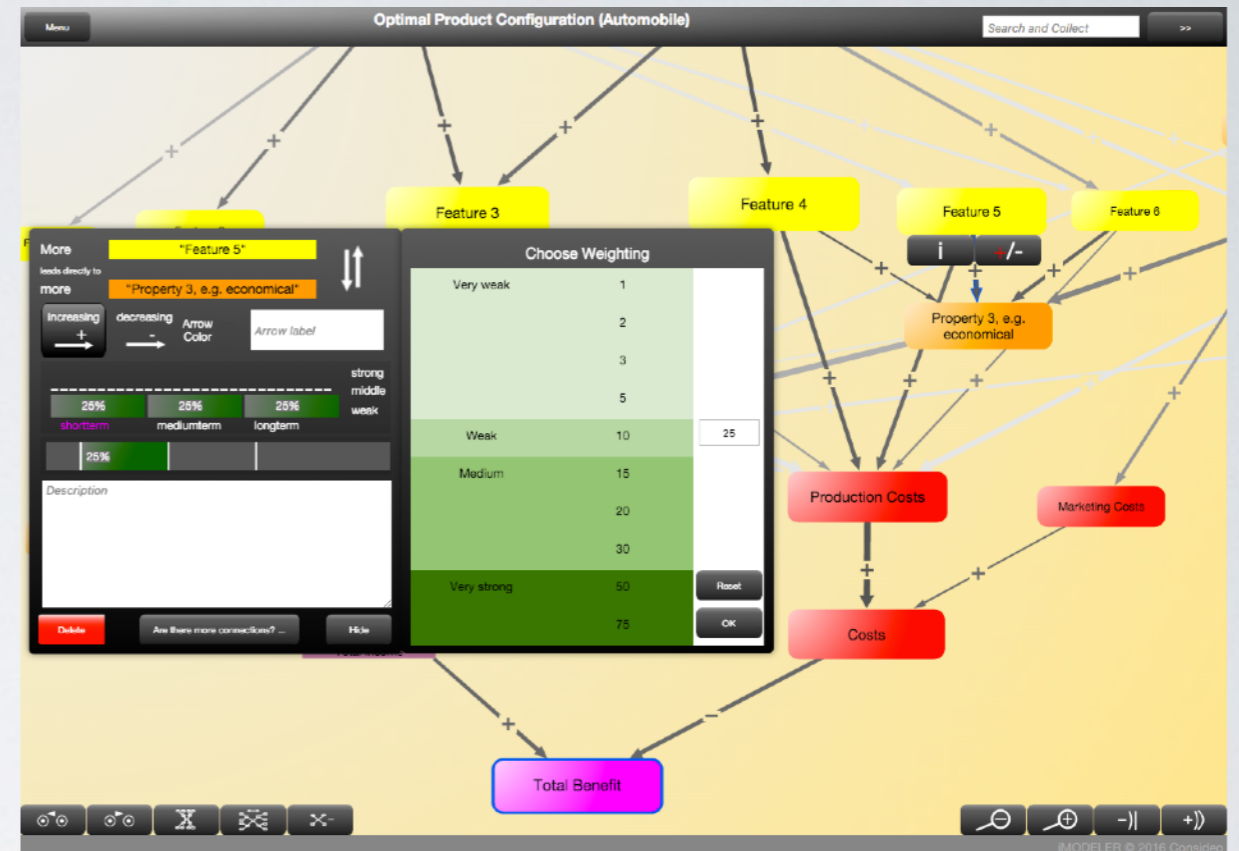
# QUALITATIVE MODELING

- What are the major reasons - what can we do?
- What can go wrong in this project?
- What features should and could we offer? (QM, FMEA, DRBFM, Risk Analysis, Six Sigma)
- How can a change of culture work?
- Where are the potential synergies and trade-offs between these targets?



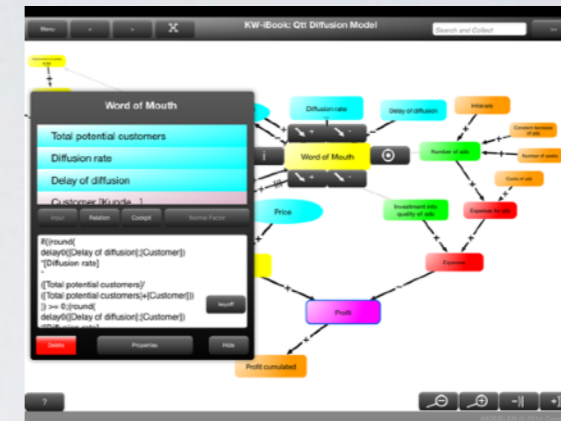
# QUALITATIVE MODELING

- Use of natural language to collect arguments and draw their interconnections
- Rough weighting of influences „more of ... leads directly to more/less of ... in a comparable weak/medium/strong way“
- Use of Insight Matrices and Tornado Charts to see what has more positive or negative effect on your targets.

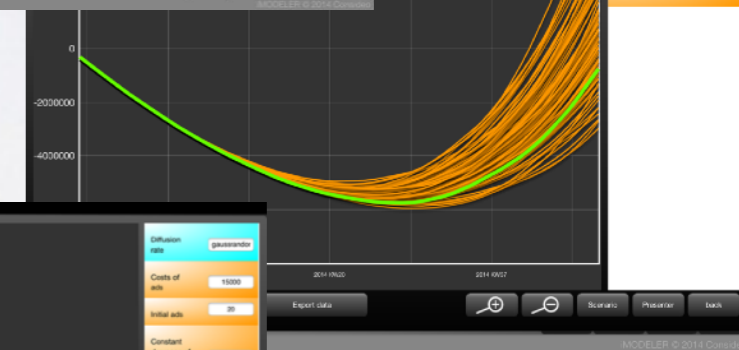


# QUANTITATIVE MODELING

- Quantitative models (System Dynamics based...) indicate...
- ... with what likelihood (use Monte Carlo simulations) to what possible extent something might happen at what point of time
- range() functions allow for identification of optimal parameters (Operations Research) or regressions analysis
- Data from the past allows to validate the model (to a certain extent)

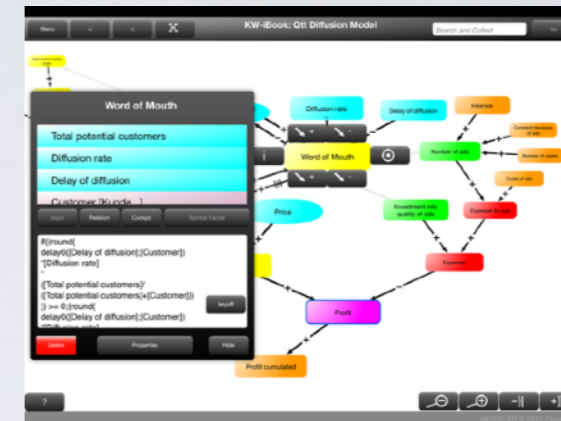


Time	Quantum rate	Verkauf in Euro	Neukundenzufuhr	Prognosegenauigkeit
1	15.00	2.47	0.03	0.08
2	18.89	2.47	0.03	0.11
3	22.77	2.46	0.03	0.13
4	26.66	2.36	0.04	0.16
5	31.14	2.33	0.04	0.18
6	35.80	2.30	0.04	0.20
7	40.63	2.27	0.04	0.22
8	45.64	2.24	0.05	0.24
9	50.81	2.21	0.05	0.26
10	56.14	2.18	0.05	0.29
11	61.62	2.16	0.05	0.30
12	67.26	2.13	0.05	0.32
13	73.04	2.10	0.06	0.34
14	78.97	2.08	0.06	0.36
15	85.04	2.05	0.06	0.38
16	91.25	2.03	0.06	0.40
17	97.60	2.01	0.06	0.41
18	104.07	1.98	0.07	0.43
19	110.68	1.96	0.07	0.45
20	117.41	1.94	0.07	0.46
21	124.27	1.92	0.07	0.48
22	131.25	1.89	0.07	0.49
23	138.34	1.87	0.08	0.51
24	145.56	1.85	0.08	0.52

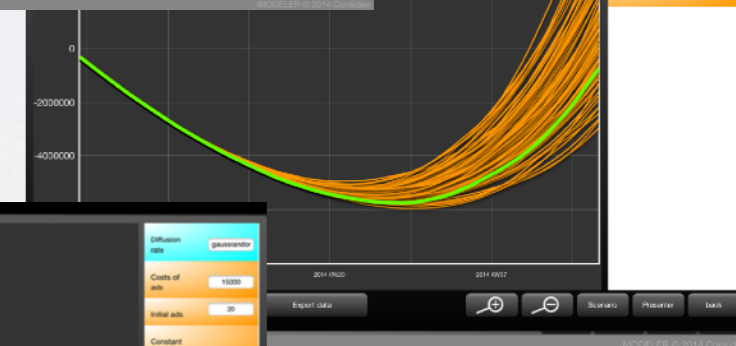


# QUANTITATIVE MODELING

- What would be the prospected revenue?
- What is the likelihood of resource scarcity and their prices?
- What could be the path of market penetration?
- What would be the optimal choice of components considering their service intervals?
- GHG emissions, renewable energy, need for resources, consumption patterns, economy outlook, environmental impact and the development of welfare and happiness
- LULUCF (GHG, wood, organic farming, feeding the world, ....)



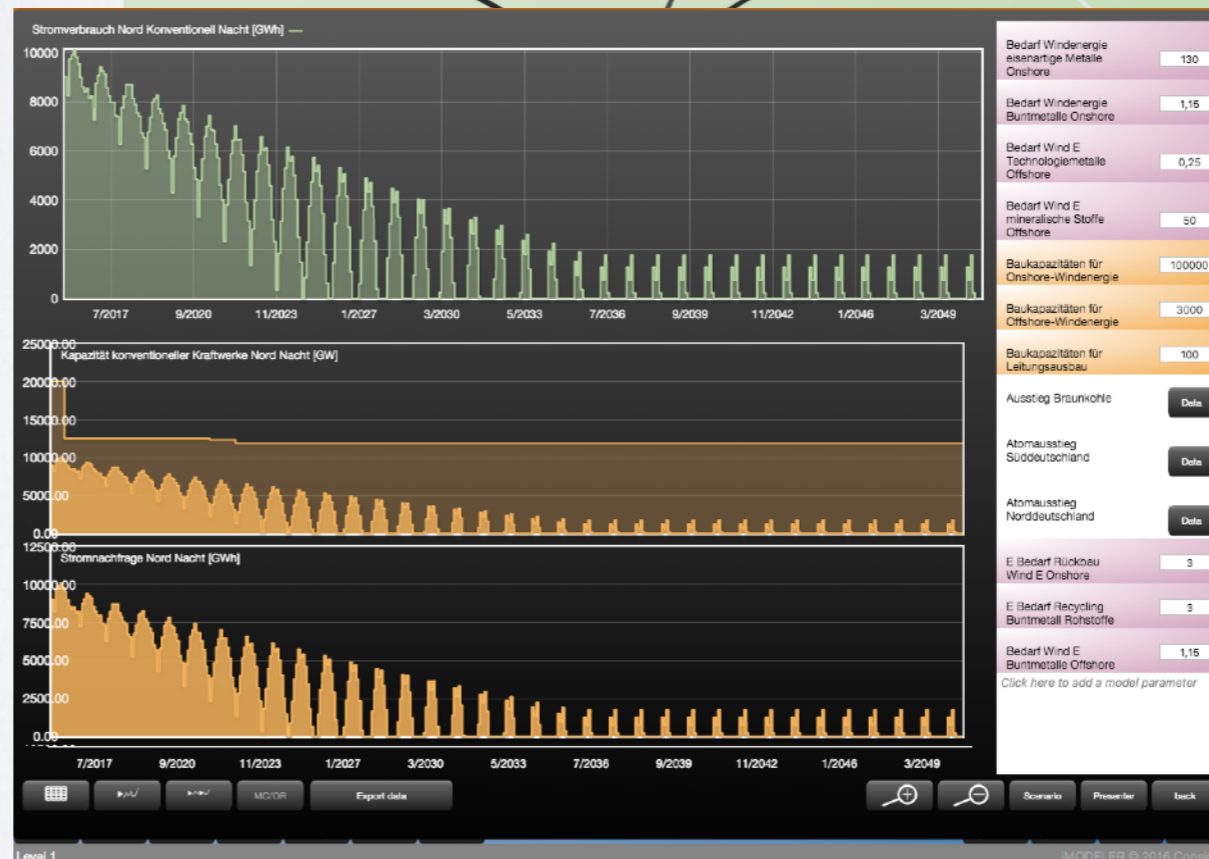
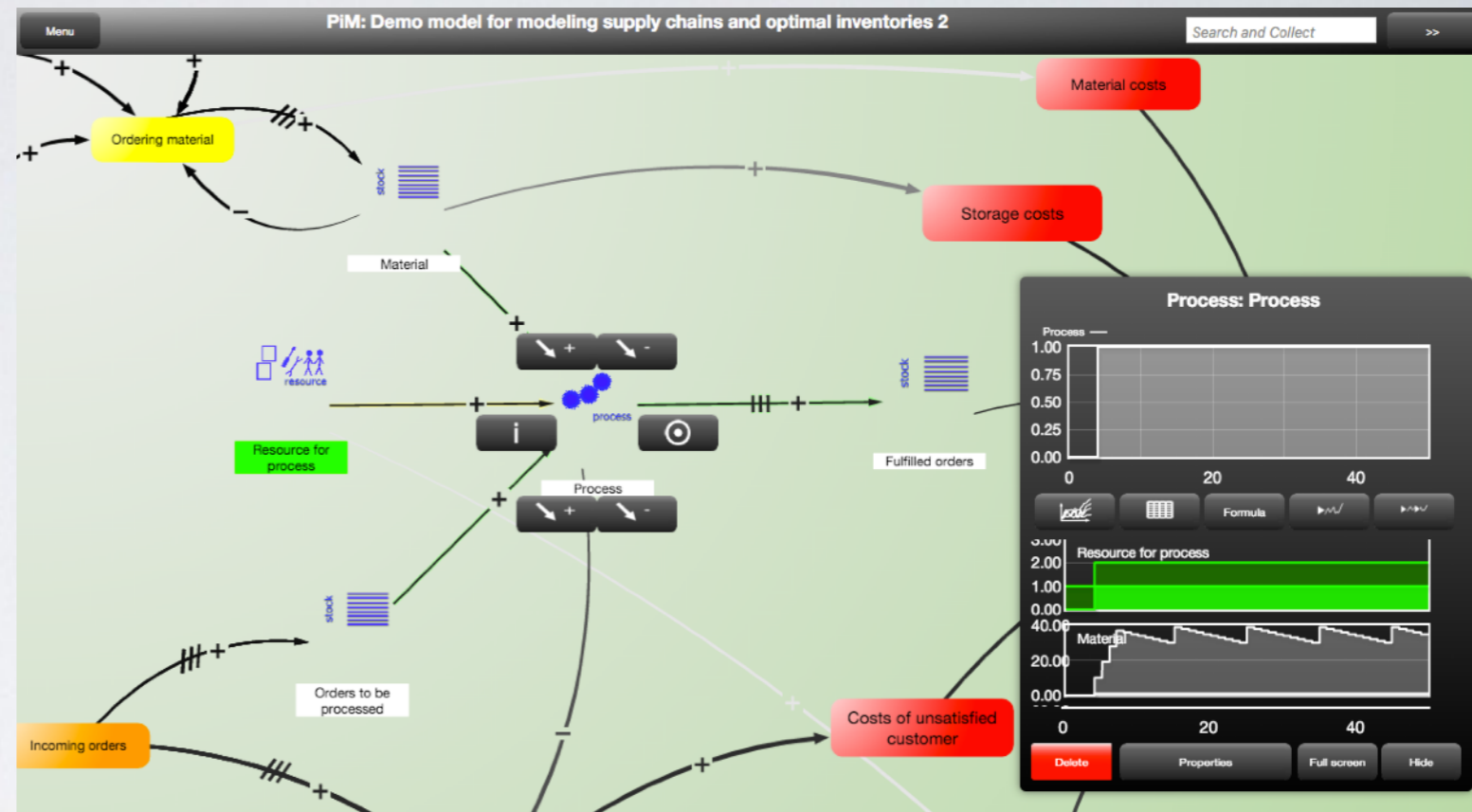
Time	Quantität ads	Verbrauch an Geld	Nachfrage an Kohlen	Produktion für Kohl
1	15.00	2.47	0.03	0.08
2	18.89	2.47	0.03	0.11
3	22.77	2.46	0.03	0.13
4	26.66	2.36	0.04	0.16
5	31.14	2.33	0.04	0.18
6	35.80	2.30	0.04	0.20
7	40.63	2.27	0.04	0.22
8	45.64	2.24	0.05	0.24
9	50.81	2.21	0.05	0.26
10	56.14	2.18	0.05	0.29
11	61.62	2.16	0.05	0.30
12	67.26	2.13	0.05	0.32
13	73.04	2.10	0.06	0.34
14	78.97	2.08	0.06	0.36
15	85.04	2.05	0.06	0.38
16	91.25	2.03	0.06	0.40
17	97.60	2.01	0.06	0.41
18	104.07	1.98	0.07	0.43
19	110.68	1.96	0.07	0.45
20	117.41	1.94	0.07	0.46
21	124.27	1.92	0.07	0.48
22	131.25	1.89	0.07	0.49
23	138.34	1.87	0.08	0.51
24	145.56	1.85	0.08	0.52





# PROCESS MODELING

- Use special factor types for processes, projects, resources, milestones and level resources
- ToC: see the bottlenecks (constraints) of each process or project step over time
- Operations Research: use the range function to identify optimal processes/projects
- Easily calculate costs of processes/projects



# EXPLORATIVE - DESCRIPTIVE

- explorative either starting from the target or by collecting factors - using as many factors as necessary
- descriptive e.g. by collecting stocks or loops - using as few factors as possible
  
- quite often a descriptive model is derived from an explorative model
- as sometimes a quantitative model follows a qualitative model



# OUR EXAMPLE

- [www.know-why.net](http://www.know-why.net)



# EXPLORATIVE MODELING

- What question should the model answer?
- What is the overall target?
- 4 KNOW-WHY Questions: What leads directly to more, what to less, what to possibly more in the future, what to less in the future?  
... factor by factor
- Speak the connection sentences: “more of ... leads directly to more/less of ...”
- Try to reach concrete levers for action and reflect on them as well
- Weight the connections, the influences onto one factor, usually starting with the strongest impact
- Use categories and colors to distinguish targets, measures, resources, obstacles etc.
- Consider using quantitative attributes like “current state”
- Start with the Insight Matrix of your overall target. Continue with other factors. (compare the position on the horizontal axis to see a factor’s influence compared with other factor’s)
- Use the “Show-Why” of the bar chart view to see the cause trees and the feedback loops that explain a factor’s effect
- Consider to prepare a presentation (Menu ... Presenter) and share the model (Read Only or Collaborative or even via [KNOW-WHY.net](https://www.know-why.net))



# “IT’S THE PSYCHOLOGY, STUPID!”

- “Basically, all models are wrong, but ...”

- “A fool with a tool is still a fool...”

- “Garbage in, garbage out”

- The conclusions from model are correct until a factor is missing or a connection is wrong (abductive logic)

- Qualitative social research

- Grounded theory

- Fuzzy Cognitive Maps (FCM)

- Mental modeling

- Group model building (e.g. via world cafes with a collaborative model)

- 1/3 of time for collection of arguments

- 1/3 weighting of arguments

- 1/3 analysis and communication

- People don’t like efforts and uncertainty, rather they know it already or call it too complex...

- .... they don’t trust the many assumptions made and refer to their gut feeling



# MUNICH AIRPORT

- Levers against absenteeism
- Qualitative model showed the levers...
- ... yet the customer wanted a quantitative model with scorecards to see improvements over time
- <https://www.consideo.de/files/consideo/pdfs/papers/FMGProjektberichtConsideo.pdf>

Projektbericht: **Reduktion von Mitarbeiterausfällen bei der FMG**  **CONSIDEO**

Die Flughafen München GmbH (FMG) managt erfolgreich einen der modernsten Flughäfen der Welt und ist bekannt für ein modernes Management. Erst kürzlich wurde der von der Gesellschaft für Projektmanagement, GPM, ausgelobte 'Deutsche Project Excellence Award' gewonnen.



Eine aktuelle Herausforderung der FMG bestand darin, einen zunehmenden Krankheitsstand zu erklären und erfolgreiche Maßnahmen zur Senkung zu identifizieren. Neben klassischen Beratungsansätzen ist auch die Methode der Ursache-Wirkungsmodellierung gewählt worden, da die Ursachen in einem komplexen Zusammenspiel von so genannten harten Faktoren, wie der Arbeitsbelastung, dem Durchschnittsalter der Mitarbeiter etc., und weichen Faktoren, wie der Kommunikation, dem Teamgefühl, dem unternehmerischen Denken etc. vermutet wurden.

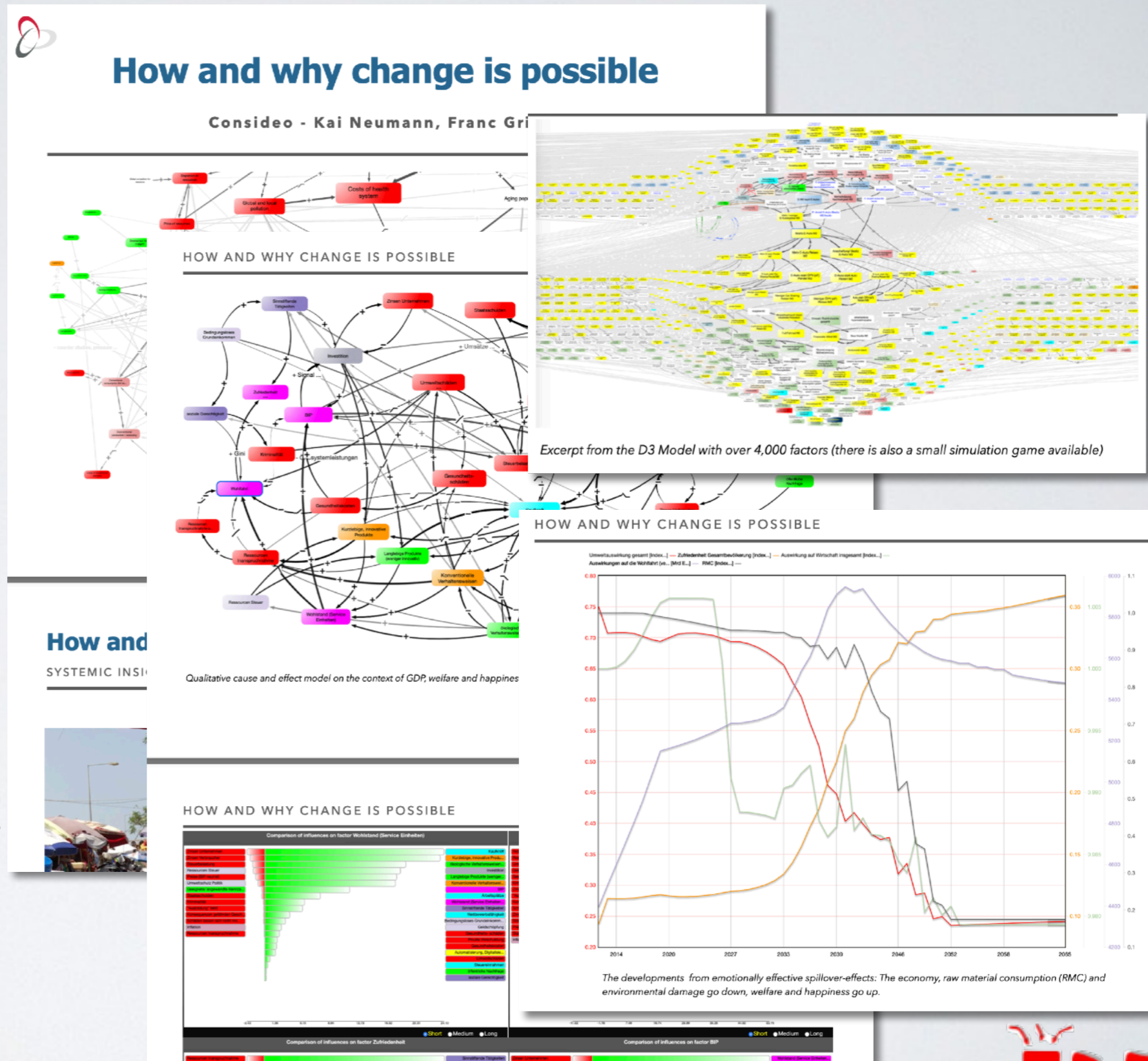
Eine individuelle, komplexe Situation zu begreifen benötigen wir ab einem dynamischen Zusammenspiel von mehr als 4 Faktoren Studien<sup>1</sup> zufolge Hilfsmittel zur Visualisierung und Analyse von Zusammenhängen. Mit dem preisgekrönten CONSIDEO MODELER<sup>2</sup> bahnt sich hier eine extrem einfach zu bedienende Software einen Weg in die Welt der Planer und Entscheider. Weltweit in den namhaften Großunternehmen, durch etliche Trainer und Berater und in vielen internationalen Organisationen und mittlerweile sogar in Schulklassen wird 'gemodelt'.

Mit dem ebenfalls in dem Gesamtprojekt "Mensch im Mittelpunkt" bei der FMG angewandten klassischen Beratungsansätzen wurden zwar Ideen für Maßnahmen



# INTEGRATED ASSESSMENT MODEL

- Change towards sustainability (participatory stakeholder modeling)
- Quantification of spillover-effects over social milieus (4,500 factors)
- Economy, welfare, happiness, the environment, resources...
- <https://www.consideo.com/files/consideo/pdfs/papers/eng/ConsideoPaper-IAM-Engl.pdf>



# FURTHER INFORMATION

- [www.know-why.net](http://www.know-why.net)
- [www.consideo.com](http://www.consideo.com) (the papers in particular showing examples and backgrounds)
- [www.imodeler.info](http://www.imodeler.info) (register to freeware of iMODELER)
- Use 'SDS2024' to get 50% off the price for anything from the Consideo Shop
- [neumann@consideo.com](mailto:neumann@consideo.com) to directly ask me for any help :-)





# YOUR QUESTIONS

• .....

