

An ode to the sketch.

Published in 2007 in te Dutch dutch language.

introduction

In the design process we work with virtual reality or 3D models. The so-called CAD models. These virtual models give the impression that the design is, qualitatively at a high level. In practice it often appears that the virtual model is, only the virtual view of the reality of only one man or a woman, the creator of the model. As a result, the model is not the outcome of all the knowledge and expertise of the whole design team. In order to eliminate these shortcomings, it is proposed, especially in the beginning of the design process, to use the **sketch**¹ as a design-communication medium.

Is more better!

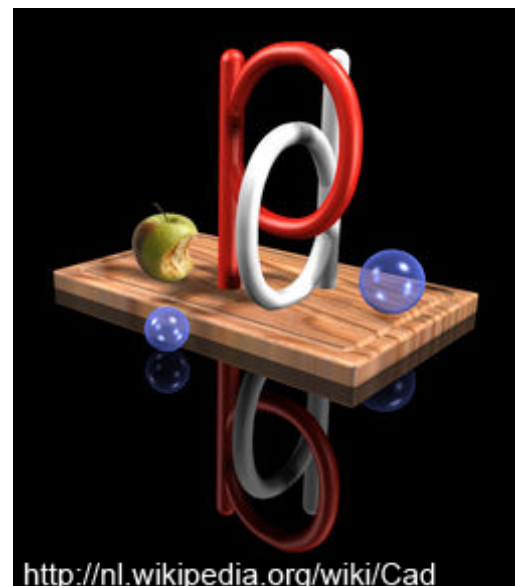
In the design process, a trend can be observed to make as quickly as possible a virtual model. The idea behind this phenomenon is the assumption: if the quality of the model is better, the quality of the design will also be better.

Is this true? Is more better?

In this trend I notice that the proposed virtual quality does not fully correspond to the expected quality by all the members of the design team. This misconception of quality is reflected in the number of changes (change loops) that are still needed to bring the quality of the virtual model into line with the 'real' desired reality.

In a "3D rendering" (see photo on the right) a perfect appearance of reality is suggested. It is as if the object has already been made. In essence, this is also true. The object is reality in the virtual world. This is a virtual reality².

At the end of the design process, the design is the (*future*) description (*projection or model*) of the reality. The outcome of the design process is the real model. The more accurate the model, the more accurate the design will be. Nobody will dispute this. A more perfect virtual model is better. (more is better). There is, however, a 'but'. Usually the virtual model is only the reality from the creator of the model, and is not the reality the other design team members had in mind.



Designing a product is a team event. In this team event, **all** knowledge and experience of **all** team members must be collected in the virtual model. This is the Achilles tendon of the design process. How do you ensure all knowledge and skills of all team members end up in the virtual model? The answer to this question lies in the quality of the communication.

¹ [https://en.wikipedia.org/wiki/Sketch_\(drawing\)](https://en.wikipedia.org/wiki/Sketch_(drawing))

² https://en.wikipedia.org/wiki/Virtual_reality

The design process.

The design process is, essentially a communication process. Because the team members communicate with each other, knowledge and skills are shared simultaneously. This is called in the jargon 'the parallel development' or 'concurrent engineering³' process. The characteristic of the design process is the simultaneous coordination of the communication of all team members. Through this coordination, all knowledge and skills are simultaneously mobilized. The common things in this communication is the design specification and the model of reality. Three things are important in the project communication process. The design specification, the communication and the model of reality.

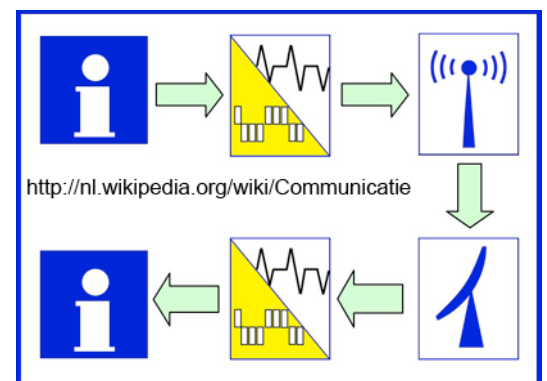
The design specification in the design process.

A design specification is a document in which the design characteristics are listed. This document is the basis against which a product or service is developed. All design specifications have in common the summary the preconditions, the functions, the requirements and the wishes. The purpose of the design specification is to be the design basis for the entire design team. Design specifications often turn out to be 'woolly'. In many words little is told. In itself it is quite an art to keep the design specification specific. Here too the sketch can offer a solution.

Communication in the design process.

In the communication process, information is encrypted, transmitted, received and decoded again. (See the figure on the right)

The communication process consists of many steps. Something can go wrong at every step. If there is one step missing in the chain, no communication (information transfer) takes place. This is also the reason that so much goes wrong in the design process. If we look at the communication in the design process then it appears that, especially in the beginning, it is very important to have a good coding and decoding process. Especially when people talk to each other from different cultural and/or different business disciplines. A production employee has a different coding and decoding skill than an engineer. Moreover, in the parallel development process, not everyone has the same type of tool at his or her disposal. Not everyone has direct access to the virtual model in the making.



³ https://en.wikipedia.org/wiki/Concurrent_engineering

History of the communication.

During the evolution of man, the human computer (*the brain*), from preservation of live, specializes in recognizing patterns. The rapid recognition of patterns had significant advantages in quickly deciding whether or not was a dangerous situation. If you were not fast enough to recognize the danger, then there was a big chance that you did not survive as an individual. Through natural selection, the human mind has become a pattern recognition machine. This pattern recognition machine can recognize patterns in a count, from raw impure data. The communication process to convey knowledge is therefore burned in our genes. In prehistory and possibly even earlier, man used the sketch to transfer ideas, strategies and experience from generation to generation. In the caves of Lascaux⁴ (France), ancient sketches have been discovered that depict the hunting scene.



Language as a communication medium.

Language, spoken and written words, is a very complex communication coding medium. Encoding information in language is a complex process. By placing arbitrary symbols in a certain order, such as speech sounds, gestures or characters, information is encoded. This information must then be decoded in the same complex manner. Some examples of the word 'smile' in other languages are: *smile*, 微笑, *lächeln*, *grin*, 미소. With the sketch it is easy to communicate the concept of 'smile'. The sketch of the smile is the same for everyone around the world. :-) 😊.

Language is apparently not the most suitable medium for conveying thoughts and concepts. It takes a child a decade before it can properly encode and decode information in language. Adults who learn a different language later in life will never be able to equal the level of their mother tongue. So why use the language as a communication medium in the design process?

Children's drawing.

Children develop early in their youth, before they master a language, the ability to communicate with sketches. In children's drawings a message is told with a minimum amount of information. What is striking when studying children's drawings is: they are all made in 2D (two-dimensional) style. The child does not spend any energy in translating the message into the 3D (three-dimensional) style.

The use of language as a communication medium is, due to its complexity not recommended in the design process. Advisable is to use communicate with sketches (*children's drawings*) if possible. By using sketches, the unique properties of the human brain is used to recognize patterns with a minimal of information.



Typische kindertekening ©07LL

⁴ <https://en.wikipedia.org/wiki/Lascaux>

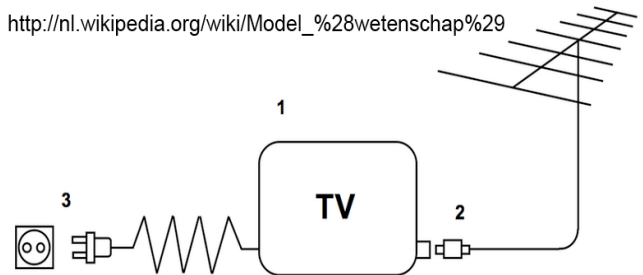
By using sketches, the design communication process is very efficient. The chance of errors, due to the small number of translations, is minimal. The sketch is the ideal communication tool.

The model of reality.

A model is a simplified representation of reality.

As an example, in the TV model, the operation of the TV can be described with a few images. The TV (*television*) (1) takes out the power, from the wall outlet (3), needed for translating the signals, coming from the antenna connection (2) into visible light signals.

http://nl.wikipedia.org/wiki/Model_%28wetenschap%29



It turns out: the simpler a model, the better it is understood. If, on the other hand, the model is (too) complex, most people can no longer contain it. The human mental capacity to contain something is limited. The sketch and not an incomplete virtual model is much more able to provide the communication between the project members.

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Skills.

1D mode the sketch.

To create a sketch, the "1D model", a limited skill is required.

Most of us are already developing this skill in pre-school years. Making such a sketch is a very simple task. It takes us no trouble. The sketching skill is in our genes. This makes the sketch the ideally tool suited for communication. When sketching as a means of communication in the design process, it does not matter how beautiful it is. Communication usually succeeds. Everyone can use the sketch as a means of communication in the development process. It is culture and language neutral.



1D

2D model the drawing.

For making a drawing, the "2D model", you need to have a talent for making drawings. If the predisposition is present, it will take at least six years before someone has the skills needed to make a good drawing. In order to maintain this skill, it is also necessary that the person in question exercises a lot. Unfortunately, only a limited number of people have these skills. Moreover, making a drawing is also a time-consuming task. The use of a drawing should therefore be avoided as much as possible, early in the communication development process. A drawing is usually the outcome of the design. It is a coded message that can only be translated by insiders.



2D

3D model, the virtuele model.

In order to create a virtual model, the "3D model", a certain degree of talent is required, just like the creation of a "2D model". In addition, an engineering education is needed to be able to translate the design specification into a makable 3D model. It is also necessary to have a large degree of skill to produce something sensible with the specific computer program at all. If in the end the person in question has the skills to be able to make a "3D model", it will cost him or her much, if not all, energy to make it a good "3D model" from scratch.



3D

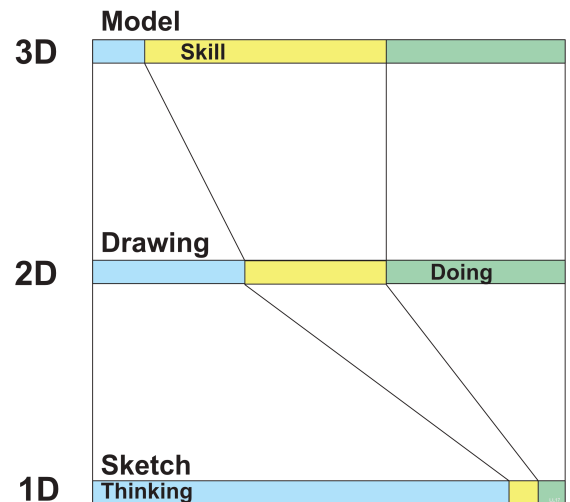
As a communication medium, the "3D model", in the design process, is very suitable. It is always finished and will give all the necessary information. Unfortunately there is a but. The "3D model" must be completely finished. Communication with a "3D model" can only focus on the end result in the design process. It does not invite to share all the knowledge and skills of other participants in the design process. Who has the skills and knowledge to change in the "3D model"? Moreover, making changes to the "3D model" costs a lot of energy and time even for the professional. As a result, there is a natural tendency to let changes in the design process take place or not, depending on the remaining available (project) energy and (project) time. As a result, the "3D model" is not (yet) suitable for use as a communication medium at an early stage in the design process.

Mental energy.

Unfortunately we are limited in our human mental capacity. When creating a "2D and/or 3D CAD model", due to the limited processing capacity of the brain, the conceptual or creative thinking space is reduced.

In modeling, thinking about the model is inversely proportional to the representation of the complexity of reality.

This thinking capacity is made graphically visible in the figure on the right. When creating a "1D model", drawing or sketch, almost the entire mental energy can be used to reflect what is modeled (outlined). For making the sketch, only a small fraction of our mental capacity is used.



In the "3D model", on the other hand, almost all mental capacity is used to make the model.

Use of a computer.

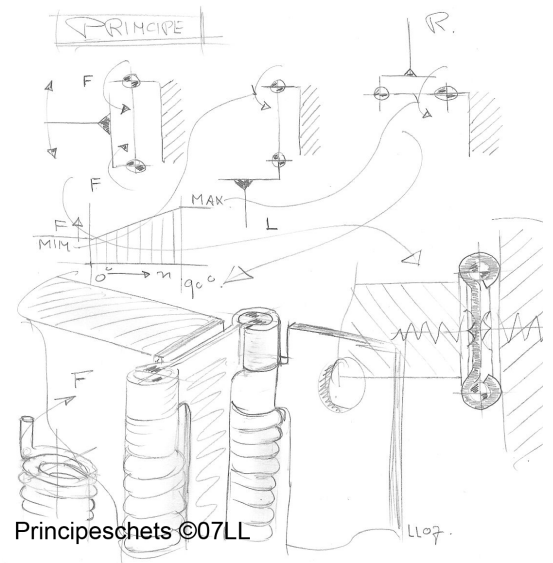
With the arrival of the computer, a device to process efficiently instructions, our way of communicating has changed. In the design process, to transfer information, often a model is used. A model is a simplified representation of reality. With the arrival of the computer it is possible to imitate almost truthfully the reality. And with almost anything that is possible it is also used. The trend is the use of the "3D model" early in the design process. The idea behind this is, more is better. At the start of the design process I see often beautiful pictures showing the virtually reality. The background thought is that more is better! Is this also true?

The function of the sketch in the development process.

In the design process, one of the most important items is the communicating with all the stakeholders. Communicating, translating the design idea, transferring concepts, etc. It is just like in prehistoric times with the hunt. Information was exchanged through communication by sketching about the hunting process. This also applies to the design process. The quality of the communication is reflected by the quality of the design.

An ode to the sketch.

In the communication process less is more. Focus on the quality of the communication. Use as much as possible the schets. As an example the principe from an dubbele hinge. See the figure oil the richt. This principle can be language independent communicated to all stakeholders.



To remember the above, the next time when choosing a design communication tool think about the 😊 sign.

Laurens

Ps, colleague teach them to use the sketch!

