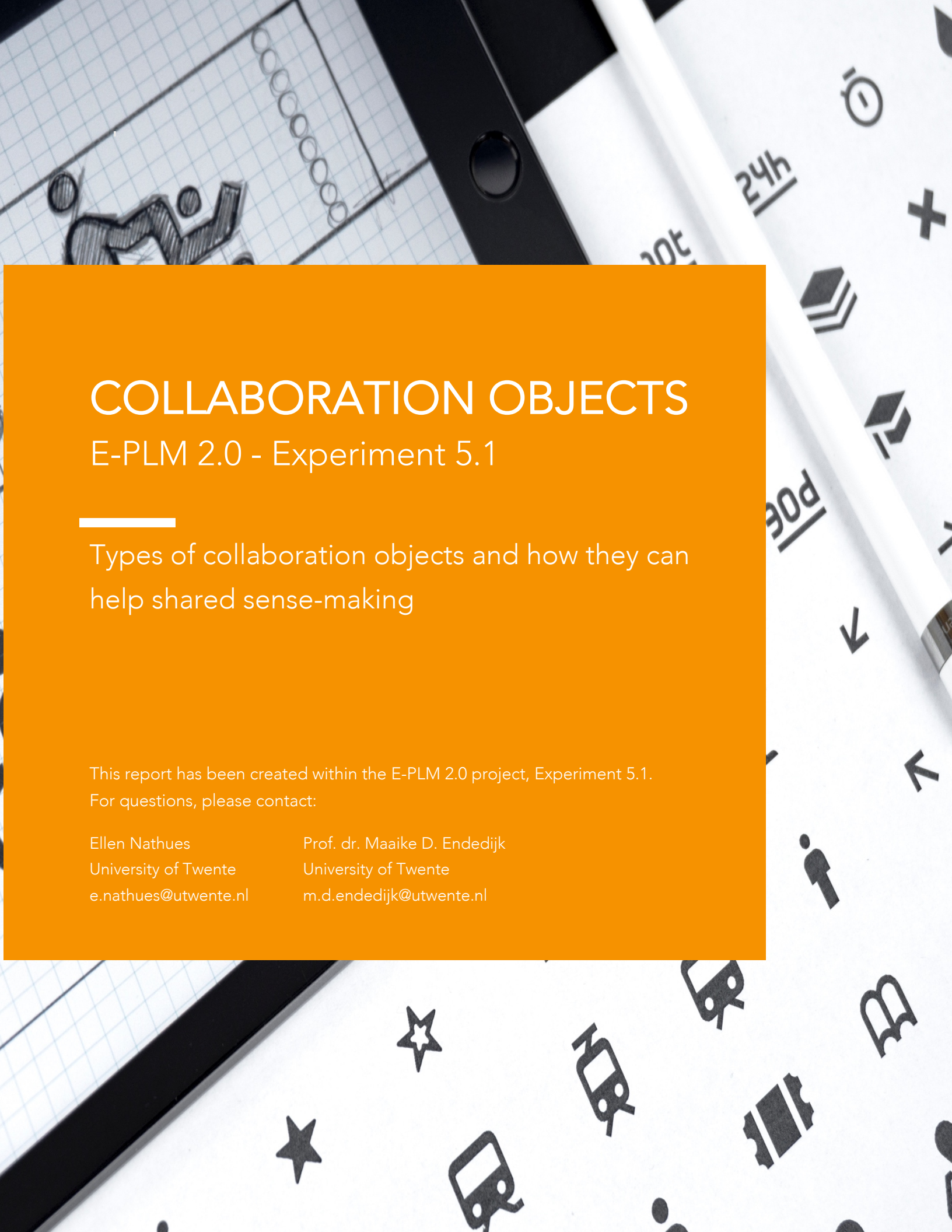


COLLABORATION OBJECTS

E-PLM 2.0 - Experiment 5.1

Types of collaboration objects and how they can help shared sense-making

This report has been created within the E-PLM 2.0 project, Experiment 5.1.
For questions, please contact:

Ellen Nathues
University of Twente
e.nathues@utwente.nl

Prof. dr. Maaike D. Endedijk
University of Twente
m.d.endedijk@utwente.nl

Collaboration objects: Types of collaboration objects and how they can help shared sense-making

More and more organisations team up and form groups and collectives stretching across organizational boundaries. Bringing together professionals from diverse backgrounds is expected to foster exchange, help innovation and facilitate learning. Yet, communicating across differences in professional and organizational backgrounds can be challenging: It is easy to mean different things when using the same words and difficult to change perspectives and think from team colleagues' points of view. We have studied how various types of objects can help team members to successfully communicate across their differences. We refer to these objects as *collaboration objects* and, in this report, share our insights and some practical recommendations. An important note in advance: For us, collaboration objects are not just objects that we can see and touch but can as well include more abstract things as metaphors, stories or examples.

Let us start with exploring three typical functions that objects can have.

Material infrastructure objects: The boring ones

We refer to **boring objects** to describe the basic and mundane infrastructures of collaboration. Without these, collaboration would often simply not be possible—just think of a meeting room or a communication system. Usually, we take these boring objects for granted. Only when disruptions occur (when the meeting room is occupied or when the communication system breaks down), then their essential and supporting role becomes very visible.

Boundary objects: The bridging ones

This type of object **bridges** across diverse boundaries. Think of two professionals from different organizations or from very different professional backgrounds: They might have a hard time in making sense of everyone's jargon or in understanding how processes in each other's organizations really work. A boundary object might help them to speak the same language:

Professional 1: I think I don't yet fully understand what you're trying to say here. How exactly do you envision your business processes to change?

Professional 2: Well, let me draw a parallel to what has happened with the coffee machines. In the past, companies all had their own coffee machines, and they bought the beans, everyone filled the machine, and so on and so on. I think that's no

longer the case in companies. You now search for someone to take care of all the coffee machines in your organization. Including beans and everything. You simply agree on the number of machines, the sort of coffee you want, and then this provider comes every now and then to check on your machines. And you as a company basically pay for this service, the service of always having coffee at your company without needing to do anything.

Professional 1: Yes, okay, I get that.

Professional 2: And that is exactly the business model that we also want for our products and our customers. So that customers no longer just buy the product from us and then that's it, but that they basically pay for the service of always having our products running at their facilities, and then we take care of maintenance, check-ups, all that.

Professional 1: Alright, that helps a lot! So, if we look at this graphic here ((*pointing to a graphic that shows various stages of providing products and services*)) then you are currently here ((*pointing to the initial stages*)) but you aim to progress towards this stage ((*pointing to one the more advanced stages*)).

Professional 2: Yes, exactly!

Boundary objects can appear in specific forms (such as the **visual** in the example above), but they can also come in more abstract shapes (such as the **comparison to coffee machines**). Important is their interpretative flexibility: They can be understood in similar ways by professionals from very different backgrounds, offering sufficient elasticity to function as translation or bridging devices across differences.

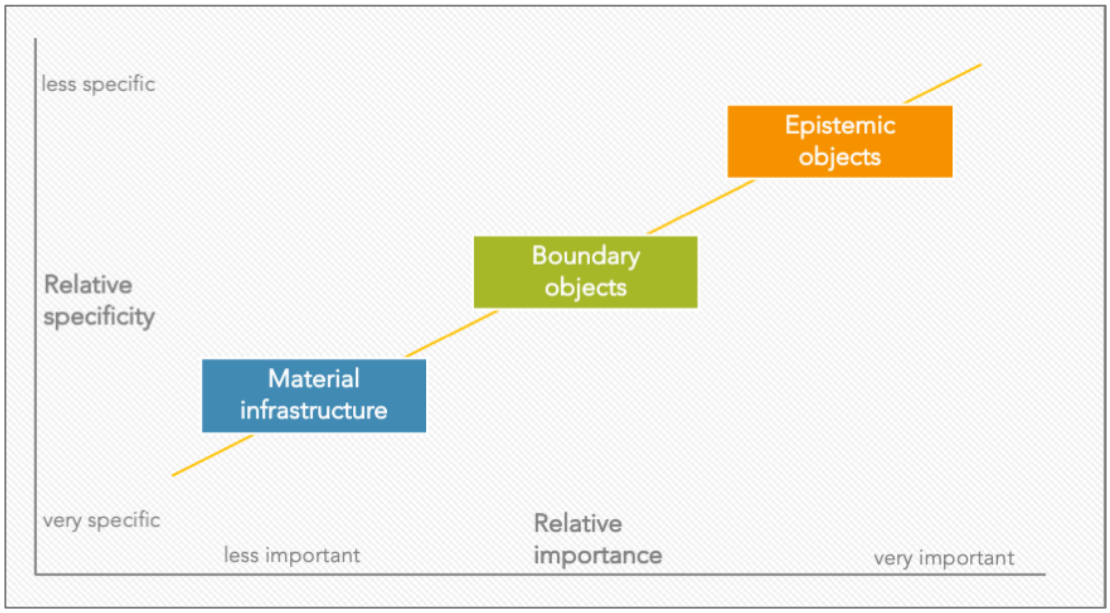
Epistemic objects: The driving ones

The third category are epistemic objects: Objects that trigger **drive** and motivation as they are incomplete, embody the unknown and link to an open question, a pressing challenge, an exciting possibility or an unfinished draft. They are important for providing direction (where to go and what to work towards) and for keeping up momentum.

The **visual** of the above example could not just be used as a boundary object but also as an epistemic one: It helps to explain in which stage professional 2's company is at the moment, but it can also visualize their objective (they want to work towards a more advanced stage). Confronting professionals with this graphic might thus help to keep them well on track.

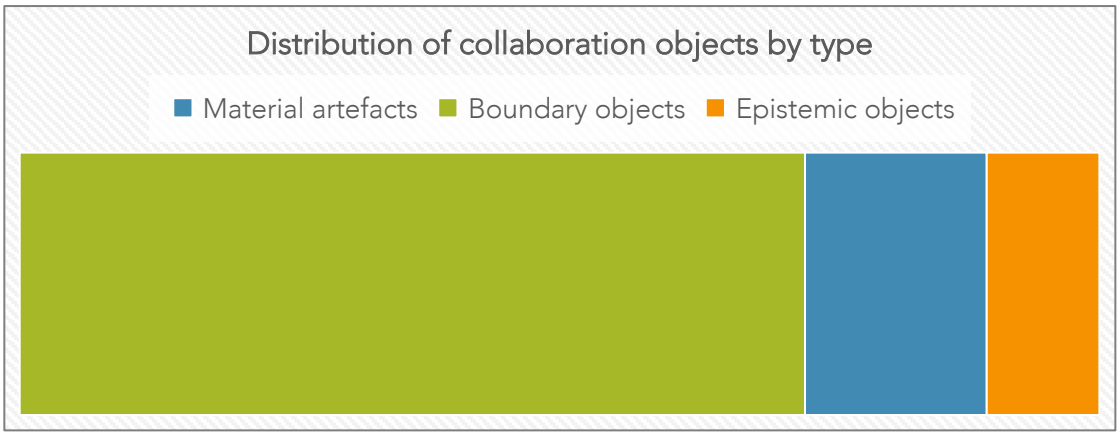
In Figure 1, we differentiate the three collaboration object types by their specificity and their relative importance for teamwork. By specificity, we here man that objects are easily observed or can be touched (such as a physical prototype, to name one example). Objects such as stories or metaphors are less specific or tangible but exist in team members' words and communication.

Figure 1: Collaboration objects types plotted by relative specificity and importance



We studied the meetings of two interorganizational teams to explore the presence of these collaboration objects. Figure 2 visualizes how usage of these three types was distributed across these meetings. Given boundary and epistemic objects relatively higher importance (Figure 1), we will focus on these two types for the remaining parts of this report.

Figure 2: Distribution of collaboration objects by type



There are two important insights that we can derive from Figure 2:

1) Boundary objects are the dominating type of collaborations objects. This is hardly surprising, given that team members had to work across and around multiple professional and organizational differences. This higher number is good indicator: members used objects as translation or bridging devices, in order to make shared sense of issues and topics discussed!

2) Epistemic objects are also used, but to a much lesser extent than boundary objects. We consider this as a chance for improvement. In two of our previous deliverables (our *Initial Report* and our *Meeting Guidelines*), we have stressed how many members missed clear and common objectives for their teams. Making use of epistemic objects might be a good strategy for solving this challenge.

Towards some practical recommendations

So, how can we make better use of collaboration objects in our everyday teamwork? We have five suggestions:

1. Put collaboration objects more center-stage in your teams!

To begin with, it is important to sensitize our awareness for collaboration objects. We tend to take collaboration objects very much for granted, not understanding the important role they can have in our teams. When they acquire a more important role (e.g., when team members all repeatedly use the same metaphor to describe their shared objective), this often happens unconsciously—and not as the result of our active efforts. We need to pay more attention to collaboration objects and their functions for teamwork and collaboration.

2. Pay close attention to collaboration objects & increase your awareness for them

Listen closely to what your team members say: Are they making use of collaboration objects? What types of objects? And what is the function of these objects on your collaboration and communication? Gaining a broad understanding of the types and functions of objects used in your team will help you to employ them more strategically.

3. Importantly: Interact with objects

To really have an effect on your teamwork, collaboration objects need to be interacted with. Your team member has used a graphic to illustrate the status quo at her organization? Ask yourself how you could use the same or another graphic for your company's status quo, too. Or even better: Initiate the use of a collaboration object yourself. Maybe take some time to think about an object that embodies your team's goals and then present this object to your team members, asking for their opinions. That way, you can trigger a dialogue about what you want to work towards as one team, and you can create a collaboration object to remind you of your goals.

4. And make others interact with them, too!

It is important that all team members engage with the collaboration objects. You could help your team members to do so by explicitly asking them: Solicit their opinions around a certain object (e.g., a metaphor that someone else used), invite them to think of an object that embodies their goals and questions, ask them about a collaboration object that they have used in the meeting before, etc. Also carefully check if the collaboration object is indeed contributing to a shared understanding and joint sense-making. For example, if a comparison to a car is used over and over again, this only works if everyone also understands it in the same way!

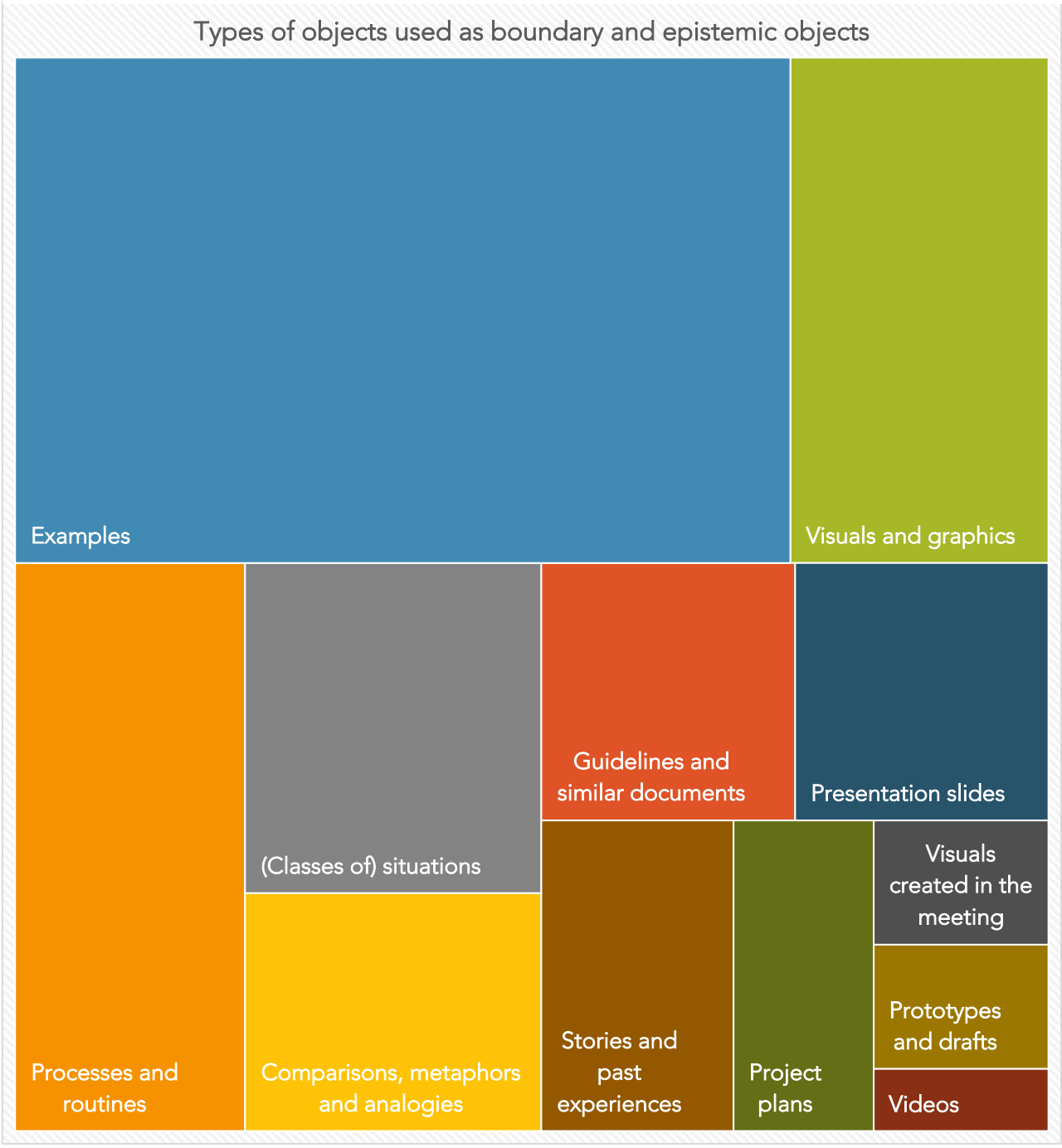
5. Your goal: A team inventory of collaboration objects

In the end, your goal should be to create a collective inventory of collaboration objects. Those objects are crucial for your joint work. It might be comparisons to parts of everyone's everyday life that help to translate across organizational and individual differences, or it might be a sketch of a new process that represents your shared objective. A simple project plan could also be a very effective collaboration object, if team members use it for shared sense-making instead of considering it as a mere and annoying must-do. If you pay attention to the collaboration objects used within your team and if you interact and engage with them, you are able to build an inventory of objects that team members can mobilize as tools and instruments for better communication and collaboration.

Ideas for possible collaboration objects

Do you now need some ideas for what could be possible collaboration objects? We guess so. Let us explore which objects have been used by members of the teams that we have studied. Figure 3 lists the most important ones, arranged by their relative frequency of usage. Please note that the objects presented here are boundary objects and epistemic objects (not material infrastructure objects).

Figure 3: Types of objects used



Examples.

Examples were frequently used as boundary objects as they helped team members to "add flesh" to their explanations and the points they were trying to convey. Examples made visible the differences and similarities that existed between professions and organizations and helped team members to form better and more specific understandings. Often, examples were also linked to stories and past experiences. For instance, when team members were explaining their organization's challenge, they invoked past experiences—including illustrative examples—to give their team colleagues a clearer and more specific account of this challenge. Examples are a great strategy to reduce ambiguity: By adding details, less room is left for speculating, guessing and wondering.

Visuals and graphics & videos.

Visuals and graphics were also frequently used as boundary objects. They were generally displayed using screens and/or presentation slides (thus in combination with material infrastructure or "boring" objects). For instance, one team made frequent use of a graphic that visualized multiple important phases of a development process. In order to facilitate better understanding of each other, team members used this graphic as a translation device and located their companies in one of these phases. Interestingly, this specific graphic was not just used as a boundary object or translation device but, over time, also became an epistemic object. None of the companies was in the most advanced phase of the graphic yet and team members collectively decided to make this fact their team's focus and direction: They wanted to investigate why there were not in that phase yet, whether it would be possible for them to go there and what that would exactly take. Through its frequent usage as both a boundary object and an epistemic object, the graphic became an important part of the team's DNA, enabling shared understandings and providing clear orientation on direction and objectives. As a possible consequence, the graphic lost much of its visible specificity over time: while initially team members showed the graphic whenever they were talking about it, over time first short verbal references and later on simple gestures were sufficient for team members to know that they were talking about the graphic again.

Instead of referring to visuals, team members can also refer to videos, for instance when trying to come to a shared understanding of a certain topic. Often, videos with definitions and examples can easily be found on the Internet. Watching these together and, importantly, discussing them can help team members to get on the same page.

Team member can use visuals that already exist, but they can also come up with own visuals in their meetings. Whiteboards or large sheets of paper help to get this creative process going.

Processes and routines, in combination with (classes of) situations.

Things often go very differently in different companies or different professions, even when processes are given the same name. It is therefore a good idea to not just name processes or routines but to explain them. You might want to explain your processes to your team colleagues in combination with classes of situation. Which steps do you typically take when a prospect approaches you with a request? Which steps do you perform when first prototyping a product? It can help to discuss these types of questions to create better understanding for possible similarities and differences.

Comparisons, metaphors and analogies.

Through using recognizable comparisons, metaphors and analogies, difficult or complex notions and ideas can be explained and illustrated in more specific and relatable ways. This can help sense-making. Team members often made comparisons to things of their everyday life, hence to things that everyone could relate to irrespective of differences in professional or organizational background. For example, in multiple of the teams we studied, comparisons to cars were very prominent. Let us illustrate what we mean with an example:

> *"So what is a product then? If you compare it to cars, then eh then it's eh the sum of all components that you can chose in the product configurator […] For example, the website of eh Ford, or whatever, where you can put together a product with all kinds of different combinations."*

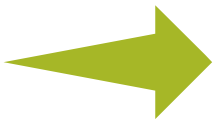
Above, a comparison to a car is drawn in order to clarify the meaning of product. This simple comparison can be very impactful: it is much easier to understand a subject when thinking about it in familiar and relatable terms. Also, with references and linkages to everyday things, it is a lot easier to make sure that everyone is talking about the same thing and is correctly understanding the others.

> *"A customer wants, well, he comes to us and wants a Rolls Royce, of course, but then he only has budget for a, for a Dacia. Or he does not even need a Rolls Royce at all, it's not at all interesting for his business case."*

> *"Well, the product needs to fulfill the requirements anyway, right? I mean, if you think you're buying a Ferrari, then you also want to have a Ferrari, and not just some red car with a horse on, right?"*

The car comparison seems to provide team members a common language to give voice to their organizations' processes and challenges without having to rely on work jargon. While the car comparison has been used mostly as a boundary object, other comparisons, metaphors or

analogies have also mobilized as epistemic objects. Overall, comparisons to and metaphors or analogies of everyday objects helped team members to speak in a common language. The meaning elasticity of these objects bridged across organizational or knowledge differences.



Want to know more, for example about guidelines, stories, projects plans …? Read this thesis, which includes additional examples as well as more in-depth theoretical discussions on the concept of collaboration objects.

Credits and acknowledgements

This report has been created within the E-PLM 2.0 project, Experiment 5.1. All insights, findings and recommendations are based on analyses of video recordings made and field note data taken while observing team meetings (as non-participant observer). We thank our master student Anne-Janique Tijman for her support in the analyses. For questions and suggestions, please contact Ellen Nathues (e.nathues@utwente.nl) or prof. dr. Maaike D. Endedijk (m.d.endedijk@utwente.nl).

We want to thank the members of the E-PLM 2.0 community for their continuous support and valuable insights.

The photo used on the title page of this report is by Balázs Kétyi on Unsplash.