

Map of statement card analysis

People making sense of data from the ground up

Stappers, P.J.; Sleeswijk Visser, F.; van der Lugt, R.

Publication date

2023

Document Version

Final published version

Citation (APA)

Stappers, P. J., Sleeswijk Visser, F., & van der Lugt, R. (2023). Map of statement card analysis: People making sense of data from the ground up. Delft University of Technology.

Important note

To cite this publication, please use the final published version (if applicable). Please check the document version above.

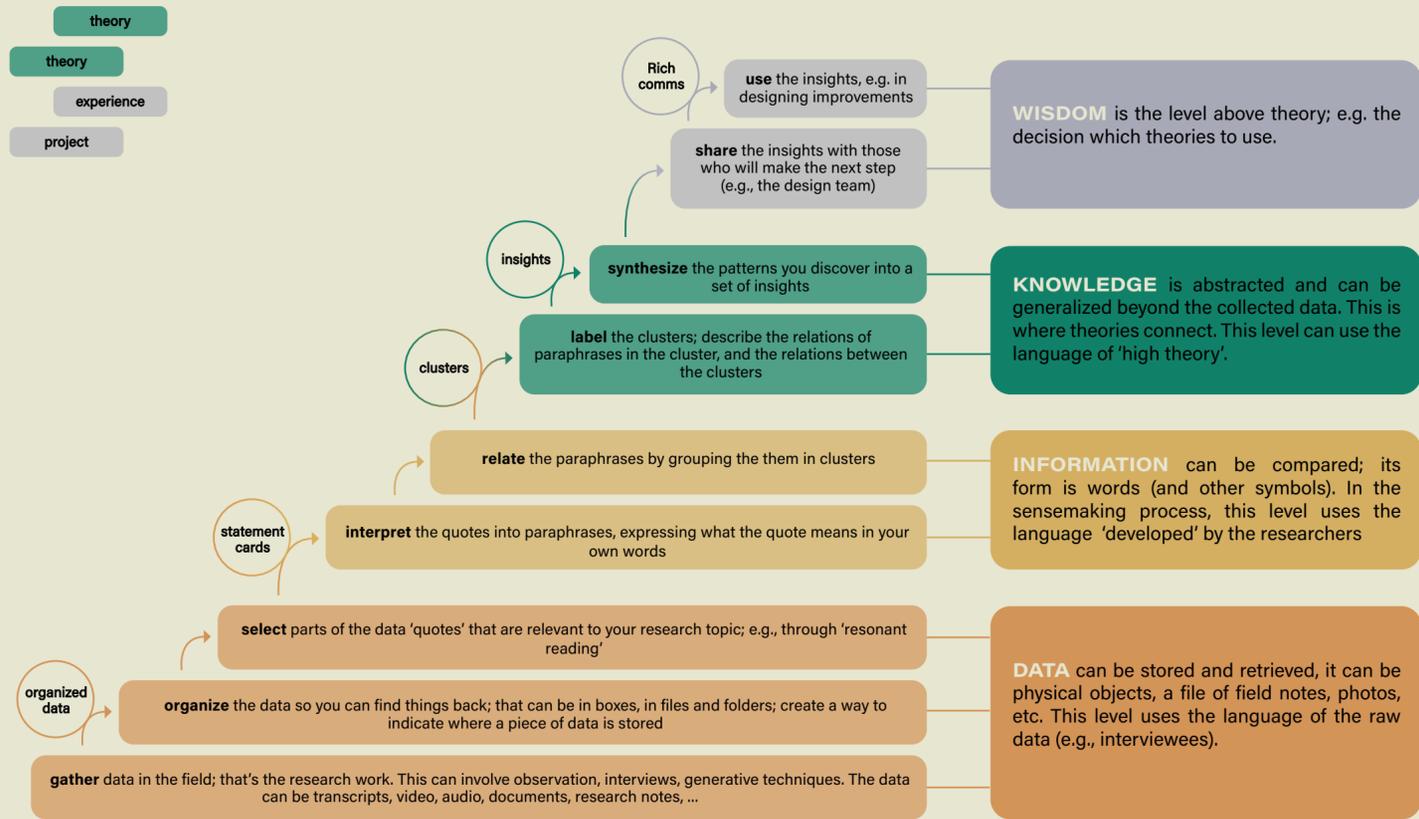
Copyright

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy

Please contact us and provide details if you believe this document breaches copyrights. We will remove access to the work immediately and investigate your claim.

Understanding of theories, experience with the context, theories, awareness of the application all play a role in the back of the researchers' mind. Be aware of this and use it wisely.



Activities in the process

In Statement Card Analysis, designers formulate an explicit interpretation for each bit of data they select. They review, discuss, and evolve these interpretations. Then they organize them in clusters. These clusters are in turn given an expressive 'label', and different clusters are linked to get at overarching insights. In this way, a ladder of abstraction and generalisation is constructed, which forms the insights, which are then transferred to the next step of application, e.g. determining design directions or solutions.

The name 'analysis' grew in use, but 'sensemaking' makes more sense now: this is not about breaking up the world into detailed facts toward a single theoretical perspective. Rather: discovering perspectives, connections, unexpected factors and opportunities that serve people to act in a situation, e.g., develop a design.

The process results in formulated insights, but just as important may be what remains in the members of the design team, who used their knowledge in discussing and creating a language that supports and expresses the nuances of the generated insights. Those involved gain more insight than can be expressed by the tools to an outsider. Therefore it can be important who takes part in the sensemaking process.

Along the process, designers should take care that the qualities of the tools, whether they are in print, or digital, support both the individual and the team's activities of making sense of data: thinking, considering, discovering links between elements, articulating, communicating.

Form matters.

Statement Card Analysis is a sensemaking technique for qualitative research. You use it to discovering patterns in data from field research ("who when and why do people do this"). You can also use it to articulate what abstract concepts mean in a specific context ("what does 'freedom' mean for someone with a chronic medical condition").

With these methods, the design team develops their 'framing' of a phenomenon, a lens or language to describe the situation that was studied.

The techniques build on reflection, on personal qualities such as sensitivity, empathy, awareness of possible biases, and contextual knowledge such as the goals and budget of the whole project for which the context exploration was done.

Why this map?

Over the past 15 years statement card analysis has been part of master education at Industrial Design Engineering, and elsewhere. The technique has been used in 100+ projects, and the course 'Context & Conceptualisation' has catered to 4000+ students of Design for Interaction and Strategic Product Design. Along the years we deepened our experience with the technique, and have learned, and taught, several tips and tricks.

These tips and tricks we share in this map.



MAP of STATEMENT CARD ANALYSIS

PEOPLE MAKING SENSE OF DATA FROM THE GROUND UP

2023 Pieter Jan Stappers, Froukje Sleswijk Visser, & Remko van der Lugt
Faculty of Industrial Design Engineering, TUDelft

Sensemaking is not a mechanical process of distilling data into more abstract and general formulations. To understand how statement card analysis takes place, we should consider the tools, the individuals that use them, and the value of doing it together. Each perspective helps to tune the process as a whole. Each perspective emphasizes a part (e.g., data on a wall or in a computer, a solo researcher thinking in her preferred style, and a team situation that fits their collaboration).

Tools used

Organized data allows you to find back evidence later. Use a systematic way of storing and labeling your data (e.g., naming of filenames, numbering of photos)

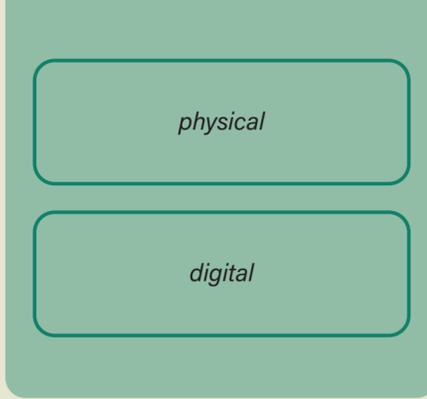
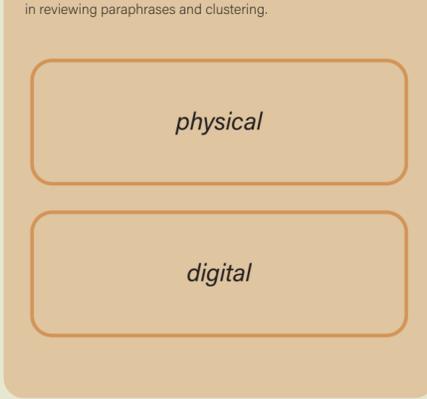
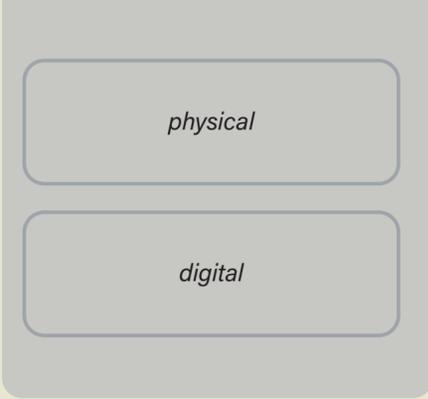
Preconception dump, e.g., a mindmap or board of Postits, is essential to convince yourself (or others) afterwards that what you found is a 'new insight'. Often the great discoveries appear 'trivial' once presented. If you have evidence you (or your audience!) didn't know it yet, that lends credibility, and avoids unjust disappointment.

Rich communications capture information, inspiration, and evoke empathy for the people in the field research. Tools include personas, scenarios, characters, demos, design directions, proposals, ... all depending on the audience, their needs and abilities.

Clusters contain a number of statement cards, and carry a label that describes the cluster as a whole. Clusters can have an internal structure (how the cards fit together). Sorting the cards into clusters and formulating the cluster label is an important effort best done by a team.

Statement cards link a quote in DATA to a paraphrase in INFORMATION. The card should also show some context of the quote, and carry a pointer where the quote can be found in the organised data.

Insights are the structure, models, and patterns between the clusters. There are many forms, often involving relations, influences. Visual diagrams can be very helpful in structuring this level. It is at this level that it makes sense to connect to existing theories and where 'grand results' can be formulated (although effective communication will draw on all DIK levels).



Tools make visible (& remain afterward)

The tools, and often the methods, of data analysis are usually described in terms of objects (words, text, photos, labels, statements) that are manipulated, leaving out of the picture who is doing that (man, woman, machine, ..). We have the (1) organized (raw) data, e.g., photos, transcripts of interviews, (2) the statement cards, which link a selected piece of data to an explicit interpretation by the researchers, (3) clusters of statement cards which show connections between them, and (4) a model, theory that relate the clusters, and carry the high-level insights.

For each of the tools visual design helps the researchers to see the connections. Good design supports them at what is needed at each step: focus, overview, connection. What needs to stand out? What should be there but not distract? We show good and bad examples in this map, but urge designer researchers to craft their own.

The tools perspective highlights the 'evidence' in the process. Tools can be consolidated, saved for later. Documents can be linked and shared. The meaning of them can seem permanent and objective.



People do the thinking (& learn themselves)

Sensemaking is not automatic or mechanical. It builds on more than just the data. It is done by a human person who makes use of her judgement, background, training, and life experience in order to define meaning to the data. Every person will therefore come with somewhat different interpretations. Some people are more sensitive to social expressions. Some people are better with formulating their impression in words. Some have a deeper understanding of for what purpose the research is done. Some may have been involved in the fieldwork (and had experiences that are not in the recorded data). These extras are important for making sense. They are also tacit, not visible on the tools for the outsider. Making them explicit (e.g., in the paraphrase, or by adding field notes as data) can help to fortify the structure, and guard against undesired biases.

The person perspective emphasizes the researcher develops a language about the topic. The tools should be shaped to support her thinking. People think in associations rather than in strict 'dictionary' definitions. The word 'mother' does not just mean 'female parent of anyone' but conjures up an association of your own mother, and a rich set of experiences. That's part of interpretation.



It's richer together

When analysis is conducted by a team of researchers, these differences and similarities come into play. Different team members can have complementary expertise, connection to the project, or skills. When several members select the same quote, or come up with the same paraphrase, this 'strengthens the case' for an interpretation. When they have different views, this provokes an exploration of what deeper meanings or more relevant interpretations are, and finding stronger formulations. Teams may divide workload, but more importantly teams can bring together complementary experiences, knowledge of the project's goals and context, or understanding of relevant theories. It may be useful to involve team members from 'both input and output sides' (users from the field research, designers from the 'next step').

The team perspective emphasizes that the sensemaking builds shared understanding. The tools support collaboration between the team members (discussing the wording of paraphrases, reconsidering a grouping or a cluster label) build on shared 'sharpening the mind'. And the joint effort can have impact for collaborations elsewhere in the project.

In our experience, sensemaking as a team is the best way for students to step into sensemaking, to discover how to deal with their gut feelings, and see how formulation, considering alternative interpretations, etc, and to build confidence and skill.

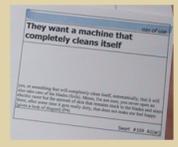


Statement cards

About these examples: in C&C little instruction is given in how to 'template' it, resulting in a variety of forms. Several solutions work well, some we do not recommend, and here's why (with thanks to all who made these mistakes).

Format

Each card has single 'paraphrase' which stands out; the 'quote' can be read, but does not draw the attention away, because the paraphrases need to be compared when clustering. With the quote there is also a short backpointer telling where the quote was found.

On paper	On Miro
	
<i>The color identifies the researcher who made the interpretation, so it is easy to ask him/her, and to see who contributes much on which topics. The color bar could also be used to identify the speaker of the quote (if you expect that that is useful in analysis)</i>	<i>With digital cards it is easy to adjust the paraphrase. Automatically scaled fonts mean you don't have to adjust size by hand.</i>
<i>Don't overload the cards (don't add more information fields which could distract, or use two coding colors for researcher and speaker)</i>	<i>Because quotes are usually plain text, you can use bold and italic to emphasize a part of the quote or context so it is easier for a reader to link the paraphrase to the quote.</i>
<i>Don't write paraphrases by hand. Even if you have a good handwriting, it takes much more effort to read, connect. (Cluster labels are usually shorter, so these can be written by hand in good letters)</i>	

Efficiency?

Once you have mastered the technique, you may add tricks and techniques to save effort and time. For instance, start with a few clusters you really want to find out; compare paraphrases in a spreadsheet where every researcher has added his/her paraphrase in an own column.

But usually these efficiencies come at the expense of a more complex interface and interactions, and take away from reflection and discussion. Stay out of here until you have gained skill: 'premature optimization is the root of all evil'.

Just a bit more about gathering

In the IDE course 'Context & Conceptualisation', Statement Card Analysis was introduced as a part of contextmapping. The raw data in the exercise were a set of transcripts of interviews or generative sessions. The data of generative design research is rich: participants make artefacts, tell stories about their lives at the hand of these artefacts, and may react to each other's stories.

This type of explorative research brings much more than a spreadsheet with ratings in a questionnaire: videos, photos and notes from observations, reflections of the designer, bits of evidence, the artefacts that were made. For each of these diverse bits of data you make your interpretations explicit in a paraphrase (what you take the evidence to mean), and add to that a reminder (such as the quote, a photo of the evidence) and a traceback pointer so you can find back the original data.

Especially for traceback and later use it is important to keep your data in some sort of structured collection, which can be boxes, notebooks, or folders in the computer. This allows you to create traceback pointers ('transcript 14, page 5, line 12', 'box of toys, the object that is on this photo', 'video recording 23, at 02:32 minutes', 'my field notes of 12 April, page 57').



Raw data can be made more reader-friendly by formatting it right. For example, indicate the speakers in a transcript with a name ('Mary') and a photo, not just a code number ('respondent 2'). This makes it easier to empathize with the speakers (even if the names are pseudonyms).

You are not trying to make sense of a text, you are trying to make sense of what people said and did.

Abstraction and generalization

A transcript loses expression in favor of comparableness: tone of voice, confidence, particular phrasing

Abstraction hierarchies

	<ul style="list-style-type: none"> * ... * Maintaining a relationship * Making an appointment * Sending a message * Composing a letter * Writing a text * Scribbling on paper * ... 	<p>A single piece of data (the scene depicted on the left) can be interpreted on many levels of abstraction, all of which may be 'correct'. The ones shown here form part of an abstraction hierarchy, where each interpretation answers the question 'How?' from the one above, and 'Why' from the one below. At each level, there can be multiple whys and hows (writing a text for a shopping list instead of a letter; dictating a letter instead of writing it) Which one is most helpful to your analysis depends on the project context. Finding such differences in a team discussion can help clarify your project. (for more see ref)</p>
---	---	---

It's a skill, you will build confidence

At first, selecting a quote or deciding a paraphrase may feel like a huge responsibility with little justification: "Who am I to decide what is important?". It takes some time to get to 'trust yourself' and develop a 'gut feeling' to pick up on what is relevant and what not. It takes practice to come up with paraphrases that are both compact (so you can compare them to others) and do justice to the quote (by conveying that most important part). Just like it takes time to work in a team, and to make your tools work for your understanding, rather than 'templates to fill because they are a deliverable'.

New tools

The whole process can be carried out with paper tools (printed cards, sticky notes, flipover sheets, markers), or digital tools (digital whiteboards), each have their advantages. Similarly you can collaborate physically present or online, again each has its pros and cons.

The important thing is that the process occurs within and between the researchers: coming up with good formulations, feeling sure you've covered everything, emerging perspectives, possibly new questions. The tools should support this reflection and interaction, which is why we recommend reading on paper with a marker (with no distractions), making cards in print not handwriting, and keeping the tools visually simple (don't add all kinds of codes). Especially while you

Always rephrase in your own words (don't just copy the quote)



Don't use handwriting for paraphrases

Handwriting is ok for short labels

Don't label a cluster as only a topic. Make it say something about the topic



Give the whole display a title summarizing the main insights (30 second statement)

Use lines and arrows between clusters to indicate patterns

Paraphrases are statements, not indicators of a topic "Why is this quote important, what is meant by this?"

When two people produce different paraphrases for the same quote, discuss what the two wordings do for your understanding



At the Knowledge level of clusters and between clusters, make connections with theory (not at the lower levels of Information and Data)

Use everyday words where possible, avoid theory and jargon on the cards

Use cluster labels with 'verb and noun'. Handwritten labels can be ok

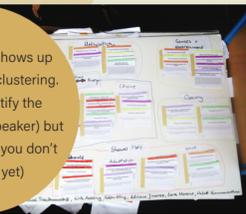


Don't make the cards too small in miro, don't stick the cards away, keep them available. Don't stack, hide, or put them in an envelope

Use space and graphics to express relations



The color bar shows up patterns when clustering. Use it to identify the researcher (or speaker) but not the cluster (you don't know that yet)



Don't overload the cards with extra information; it will distract you.

Make the paraphrases and labels stand out (not the quotes)

Quotes can show some context of what was said before and after (maybe in italics)

When arranging cards, keep the paraphrases visible (the quotes may be covered): fans, chains and trees



Split up clusters if they become too large and you see inner structure

Use layout within a cluster to explore relations between cards



Have a parking cluster for solutions



Copy cluster labels to a new work area, so you have more space to express the relations.

DIKW levels

The DIKW model (Data, Information, Knowledge, Wisdom) scheme of Ackoff (1989) is helpful for seeing the structure of the statement cards and the process of sensemaking. The model describes three separate layers of knowledge which are 'the science part', and which with these tools translate 1:1 in physical and virtual spaces. At the bottom of the model, Data, is 'raw' data gathered from the field. The data is stored and can be reviewed long after the fieldwork has finished. The top level, Knowledge, contains general statements, principles, theories etc which aim to go beyond the particular experiences from the field research (i.e., apply to future users and interactions).

The middle level 'information' is filled entirely with the language that the design team chooses. The paraphrases connect to the raw data through the quotes, and the sets of cards in the clusters which connect to theory through the cluster labels. This language should be understood by the whole team. The middle level forms the glue between the data and the theory.

It is good practice to not use terms from theories in paraphrases on the information level: keep those terms in the knowledge level. One reason for this is that the design team usually has limited understanding of the precise nuances of (psychological, sociological, technical) theories, and may 'attach a deep term' in a superficial way, not aware that the term implies much more than they intended to say. Another is that using theories implies selecting a limited perspective, which can make you blind for nuances and factors that lie outside the theory: instead of discovering structure, you merely identify points where the theory might fit.

LEVEL	CONTAINS	WHICH CAN BE...	AND TURNED TO... BY...
wisdom	theories, patterns	compar., grouped	wisdom
knowledge	interpreted symbols, concepts	stored and retrieved	using the knowledge
information	selected materialized stuff	data	finding patterns
data	stuff and events in the world	data	choosing interpretations
phenomenon (event)	stuff and events in the world	data	selecting, recording

Similarly, let data be data: it is good practice to rephrase a quote, even (or especially) if it is wonderfully evocative, because data usually carries multiple possible interpretations, and the reader may pick up an interpretation that was not intended: the paraphrase makes explicit which one was meant. Later, in transfer, we bring back the quotes to convey the insights.

Purpose and Mindset

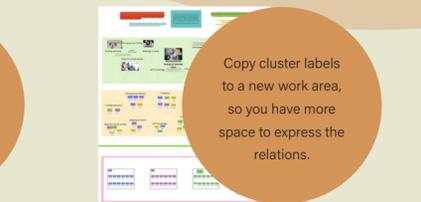
In this map we emphasize design research that works bottom-up: starting with the raw data and working toward more general insights (led tacitly by an understanding of the goal of the project, the next steps, the context, including some things about theory). The aim here is discovery (e.g., of user needs, abilities, values, and patterns in an area of their lives, e.g., "the family eats dinner together, and does so at 18:00 sharp every weekday").

The techniques can also serve theory-led research that aims at articulating the notions from theory ("what does 'mobility' mean for Dutch adults traveling to work" - does it include only "cars, trains, and buses", or also "bikes, on foot", or "private jet and helicopter", or -surprise- "let others do the traveling" and "work online"). The techniques usually do not align well with the methods of hypothesis-testing research, which require that all terms, meanings, and operationalisations are fixed before the fieldwork begins, in order to do valid statistical analysis.

Clusters

Once clusters have been identified and given a clear label, relations between labels can be explored, mapped out, organized. There are many ways to do this, ranging from system models to dimension plots. What shape these models make can vary a lot, depending on the problem, the data, the team members.

In our experience, most design teams can quickly find ways to map relations between clusters; ideas already budded in their minds during the earlier phases of the process.



Just a bit more about transferring

Design research is done in order to gain insights that can lead next steps in a design project. In practice, the people who make those next steps may not have been part of the research, come from different backgrounds, have different goals, abilities, priorities, and knowledge of the context.

Therefore, the work isn't over when you have a clustering, or a model, or a pitch summarizing the findings. You can't just throw these over the wall and hope the other side will know what to do.

In design research, the efforts of the research team to find out how to bring the insights to those 'users of the research' is an act of design which can be as intensive as the fieldwork with the users (Convivial Toolbox, chapter 4 case 4). It may involve its own research steps to find out the language, needs and opportunities of those actors.

Communication tools like scenarios, visions, personas, characters, strategy diagrams can help. As can techniques like cocreation workshops where the research team guides the 'next phase' team in using the research insights, e.g., in exploring design directions.

Design communication is user-centered. It matter who receives the outcomes.

Key References

Sleeswijk Visser, F, Stappers, P.J, Lugt, R van der & Sanders, EBN (2005). Contextmapping: experience from practice. CoDesign 1(2), 119-149. The paper in which we described how to do contextmapping research; statement card analysis is part of this.
 Sanders, E.B.-N. & Stappers, P.J. (2012) Convivial Toolbox: Generative research for the front end of design. BIS: Amsterdam. The TU Delft coursebook on doing generative design research extended the 2005 paper; statement card analysis is briefly discussed on pages 224-225; the book also gives theory behind the tools, e.g., associative reasoning and abstraction hierarchies.
 Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. Qualitative sociology, 13(1), 3-21. Influential paper about grounded theory methods, making sense from data without committing to a theory at the start.
 Ackoff, R. L. (1989) From data to wisdom. Journal of Applied Systems Analysis, Volume 16, 3-9. Origin of the DIKW scheme (discussed in Convivial Toolbox).