Types of encoding

(Word, image and number)

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Term

The three possible types of encoding to transmit content are: Word, image (graph) and number.

The types of encoding – Arguing with word, images and numbers I

The three possible types of presentation to transmit information are known as the types of encoding:

- Word
- Image (Graph)
- Number

Along with the arguments and evidence themselves, they are the actual “tools” for planning work and argumentation because, next to developing solutions, it is especially communication that may decide on the success of a argumentation or solution in planning.

„Erst wenn der Empfänger einer Information mit ihr etwas tut, lässt sich feststellen, ob er sie begriffen hat.“

“It is only when the recipient of an information does something with it that it can be determined whether it has been understood.” *(Maurer 1995)*

Therefore it is important to be comprehensive.

The types of encoding – Arguing with word, images and numbers II

In order to be understood, the planning argumentation should be transmitted in all three types of encoding simultaneously: „Combine everyday language, typical key facts and simple graphs (words, numbers, graphs) in order to be understood by others.“ *(Maurer 1995)*

Word:	Descriptions, arguments, recommendations, reports and presentations
Graph:	Plans, schematic sketches, images and diagrams
Number:	Key facts and quantities

The three types of encoding are not meant a priori for specific tasks, but all for each aspect each type of encoding can be used. The information in the different types of encoding should serve as proof for each other.

Types of encoding: Word

The type of encoding “Word” outlines all information that has to do with language. For argumentations, the type of encoding “Word” is the most important because arguments are statements and therefore language.

Similarly, communication is mainly accomplished with language – this means that “making oneself comprehensible” is achieved mainly by means of written and spoken language.

For the effect of planning argumentation, it is important that it is as unambiguous as possible. The recipient of an information should understand it as intended by the planner.

In contrast, there are a lot of difficulties connected with language and the different types of expert languages: planning is always interdisciplinary –many stakeholders with different “expert languages” came together.

Additionally, there can also be grave misunderstandings when speaking the same expert language.

The executive stakeholders do not understand any “expert languages”, especially when (as is common in Switzerland) the electorate has to make decisions on actions.

Types of encoding: Word - Language

Knowledge on the characteristics of languages are a precondition for arguing.

The most important feature of an argumentation in planning is the clarity of the statement.

Communication breaching the limits of experts fields require use of everyday language and basic sentences. People involved in planning jointly only understand simple everyday language. Communication knowledge is always very limited.

If certain specific object and expert languages dominate the limit-breaching communication, then [...] one does not understand each other anymore. Emotions and signals dominate and arguing reasonably is suppressed.

Deficiencies in communication are also a reason for the uncertainty of information.

(according to Maurer 1995)

Types of encoding: Word – Terms and constructs, expert language and termini

Terms and constructs:

- The meaning of a word is not a natural feature. A meaning is connected with a word by people that feel it should have this meaning.
- Many matters or reasonings in spatial planning can only be represented by terms or constructs. This is inevitable and has to be done with caution. Some useful questions:
  - How do I understand the term/construct which I am using?
  - Do others understand it in the same way?

Expert language and terms:

- Used termini (expert terms) have to be constructed explicitly (definition) and used correctly (consistency in a text).

Types of encoding: Word – Working with texts

Correctness

- All sentences have to be complete.
- Linguistic expressions should be as precise as possible.
- Formulations should not be informal.
- Do not use buzzwords and fillers (e.g. unthoughtful use of the word “sustainable”).
- Pay attention to grammar, orthography and punctuation.

Comprehensibility

- Who reads? Who decides)
- Formulations should be exact.

Objectivity

- Try to describe an item as precise and objective as possible.
- Show different aspects – don’t omit anything
- Include controversial opinions!
- List your sources
- Show relationships
- Be careful about your formulations

Types of encoding: Word

Central theme („roter Faden“)

This is the transparent and connecting sequence of chapters and statements and one of the most important elements for comprehensibility. If it does not exist even consistent contents may not be able to show their effects.

- Design your structure at the beginning
- Summaries and intermediate conclusions

Brevity

In spatial planning, texts are only a means to an end. The essential part is to carry out actions and decisions. Adressates of an argumentation in planning are often “interested laymen” and/or often busy. In relation to reports and decision proposals it is important to be as brief as possible.

Example: A report about a 3 month test planning procedure (e.g. Uri) has a maximum of 10 pages!

- Summarise key results on one DIN A4 page
- During projects or research plans it pays out to have a 60 second version (the so-called «Aufzugsversion»).

Type of encoding: Graph

- Graph (Greek: γραφή graphe = Scripture, graphics)
- Graphic (greek: γραφική [τέχνη], grafikí [téchni], „writing/describing [art]“)
- Image (von althochdeutsch: bilidi: „Nachbildung, Abbild“; ursprünglich: „Wunder“ bzw. „Omen“))

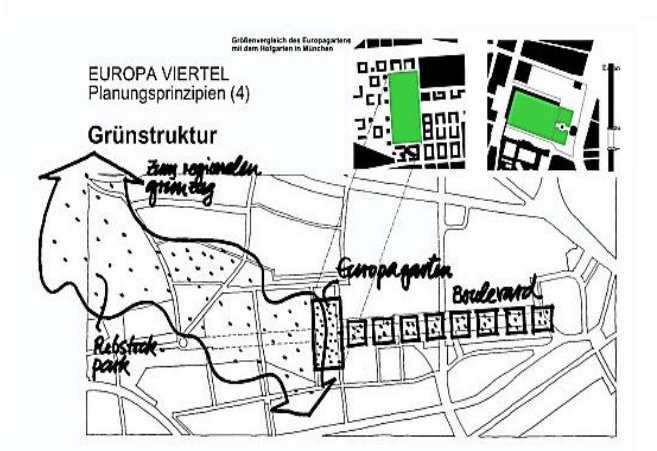
- Graphs are visual elements
- Graphs describe objects, ideas, thoughts…

- Characteristics of graphs
  - *Graphs can localise information*
  - *Graphs can visualise and structure information*
  - *Graphs can simplify and summarize complex situations*
  - *Graphs can transmit special visual information*

Type of encoding: Graph – Development of graphs in the clarifying process I

The graphical elements of the argumentation develop further with the clarifying process:

- Don‘t be afraid to sketch by hand at the beginning of the process!
  - Sketches support the thinking and discussion process.
  - They do not interrupt the clarifying process with complicated representations on the computer.
  - … and their informative value may even be higher than that of a finished plan!



Representation: M. Heller, AS&P

Type of encoding: Graph – Development of graphs in the clarifying process II

The graphical elements of the argumentation develop further with the clarifying process:

- Don‘t be afraid to sketch by hand at the beginning of the process!
- Slowly build up digital versions for presentations during the further steps:
  - Decisions become more important and with that also the precision requirements of graphical exclamations.
  - A certain „professionalism“ is required.
- During the further progress of the clarifying process the requirements concerning the level of detail and specialisation of graphs increase.

Type of encoding: Graph – Formal criteria

- Legend!
- Sources of the representation or of the basic material!
- Is a reading example required to understand the graph?

… and if your are dealing with spatial representations:

- Scale or scale bar
- North arrow

A checklist can facilitate the choice of the proper graph and the its handling:

- What do I want to depict?
- Which accuracy is required?
- What do I actually want to say?
- Do I also need the same basis for other representations?

- Clarity before accuracy!
- Work with fixed bases and information layers
- Creativity

Type of encoding: Number

Quantities are often a basis for decisions or part of the evidence in an argumentation in planning. Often, a substantial amount of resources are spent on the creation of the likes of statistics, correlation calculations, forecasts, simulation models etc.

- These resources are not always (or never) abundantly available in spatial planning.
- Additionally, handling numbers isn't always free of traps and hazards.
- It shows that the mainly arguments in spatial planning can often be verified with few, basic quantities.

Definition: Numbers are abstract mathematical objects, which represent quantities (amounts, differences, size ratios, …) and that can be used for counting, measuring and ordering (amongst others).

Origin (German): *Das Wort Zahl entwickelte sich aus dem althochdeutschen Wort „zala“, welches „eingekerbtes Merkzeichen“ bedeutet.*

For planning argumentations, the term "number" is used mainly in the sense of quantities.

Type of encoding: Number – Comparability of quantities

The important question is: Are the numbers/quantities actually comparable?

This leads to the following question:

- *Are the definitions the same?*
- *Where the numbers surveyed the same way?*
- *Are they random samples or complete surveys?*
- *….sometimes also: are they the in same scale / coordinate systems?*

Type of encoding: Number – Countability of spatial decisions

There are many attempts to justify decision based on quantified considerations (e.g. cost-benefit analysis).

Questions in respect to such procedures are e.g.:

- Are all effects of a planning decision really quantifiable?
- What has to be assumed to make it countable?
- Can these assumptions change? If yes, how sensitive does the analysis react?
- What arguments are required for the preparation of a decision?

Formalised procedures are valued as a support of decisions and argumentations. If there is a multitude of options, they may often be the only way to order the desirable solutions. However, they shouldn't be used as a sole means towards an argumentation:

- There is a great danger to place important relationships in the background,
- And they make hardly controllable assumptions for the countability of values and weighting

Maxims:

- If formalised procedures to estimate options of action are used, reflect about the planning before and after the use of such instruments!
- Always flank results with other arguments!
- Critical examination of the assumptions!

Type of encoding: Number – Repertoires for arguing with quantities

Numbers or data of a specific aspect of an planning argumentation are sometimes (often) not available. Why is that?

- There is no possibility to represent the aspect using numbers.
- The data has not (yet) been surveyed.
- The data is not available/are held back.
- You are still in the exploration phase and you cannot / don't want to ask for data.

That is why a planning argumentation often has to do without data, that could possibly be evidence for the arguments. For a quick availability of a quantitative base, it may prove useful if you can fall back on a repertoire of handling quantities.

Contents of such a repertoire are:

- A set of key facts and key ratios,
- Knowledge on constant factors in spatial planning,
- „rules of thumb“.

Type of encoding: Number – Key facts *(Kennzahlen)* / **key ratios** *(Schlüsselziffern)*

Key facts are essential quantitative characteristics of objects, measures or spatial units, that are relevant to many tasks in spatial planning. Often, key facts are available publicly. Examples for key facts:

- Population
- Share of foreigners
- Jobs
- Employees
- Area reserves
- Commuters

Key ratios help accessing knowledge by estimating sizes so that you can argue with them. By comparing specific key ratios (of different places or cases), a plausible bandwidth of the key ratio can be determined. Therefor it is advantageous if you can use key ratios from a repertoire in the course of time. They are also used to build simulation repertoires. Key ratios can set in a mathematical context using chain calculations.

- Example for a key ratio: Living area per inhabitant.

Type of encoding: Number – Regularities/Rules of thumb

Regularities: In spatial planning there are hardly any „rules“ or „regularities“ which coul be used in an argumentation. Regularities help (comparable with maxims) estimate other sizes and create hypotheses, e.g.: transport costs sink, transport velocity rises. Commuter distances increase with a rising velocity of the means of transport, BUT the time spent commuting remains the same.

Rules of thumb: Also “rules of thumb” are a kind of key ratio. They are created by experiences, but are not based on solid statistical data (such as key ratios).

Examples for rules of thumb include.:

- Capacity of a inner-city road per lane: 600-800 veh/hr.
- Investment sum for a 1 minute gain in transport time: 80-120 mil. CHF

If you know that the maximum capacity of a lane on an inner-city road is about 600-800 veh/hr, then, if you consider the current cross-sections, you can predict whether additional traffic (caused e.g. by a new shopping mall) will lead to capacity overloads or not.

Type of encoding: Number – Learn to estimate!

The initial situation of the repertoire for handling quantities during planning argumentations is estimating. “Estimating is a rough determination of quantifiable data. A characteristic thereof is that estimated data can always be measured again. “

Possible aids for estimating:

- Order similar objects
- Exercise with almanac questions
- Use of key ratios

Basic for handling quantities (especially when estimating) :

- Clarity before certainty: Which accuracy do I need, in order to justify the statement?
- Avoid achoring: “ca. 50 mil. CHF” are 50 mil. CHF

Therefore:

- Work with **ranges** (especially when using data for the future)!
- Be careful to not make your results more accurate than they really are – round sensibly
- Don’t be afraid of uncertainties!
- The rule of complete information also applies here!

Type of encoding: Number – Simultaneous use of word, images and numbers

“The more types of explanation are offered, the more the channels of perception are used (...), the firmer knowledge is saved, the more diverse it is anchored and comprehended.”

(Vester 1998, translated)

Whether I use words or graphics or images or sounds: It only matters if I can express myself unambiguously:

- If I find a landscape pretty, I can demonstrate this better if I show an image than if I calculate a “Beauty-index”.
- If I use words like «many», «approximately», «practically not», I have to expect questions. My answers could be e.g.: «More than 5’000, but less than 7’000», «Less than in...», «under 3 per cent».
- If I make a schematic sketch I should check how it can be put into words. Does it correspond to what I wanted to represent in the graph? Do I have to enrich the graph with text elements and numbers, so that they are «read» in my sense?
- And if I try to speak out a complex thought, I have to ask myself if it can’t be transcribed even better by a graph, which authenticates the text in the same manner (as a publicist would say).

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