

## The seminar 3: Mind mapping

Objectives of the seminar:

- to explain what the mind map is
- mind maps and your projects (mind mapping vs. concept mapping)
- to explain how it is possible to develop the mind map in the CmapTools

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### Introduction into the mind maps

*„Tony Buzan, variously described as a popular psychologist, a self-help guru and a business consultant, invented mind mapping in the late 1960s “as a way of helping students make notes that used only key words and images”. Since then he has developed it as a central technique in his international “brain friendly” management consultancy business. Mind maps are a form of brainstorming, they cannot be right or wrong, they can only be useful or not useful. They cannot be judged, since the purpose of any mind map that I make is to reveal my thought processes to me in order that my future thoughts and actions can proceed more clearly. If your mind map does not make sense to me, then that simply does not matter. All that matters is that it makes sense to you, and proves useful in helping you clarify and plan. Mind mapping aims to enable users to break free of their habits and to think creatively. It is a tool that aims to assist in the opening parts of a mental process. If I wanted to write an essay on symbolic forms and was confused by my reading and uncertain where to start then I could, conceivably, begin by making a mind map. Out of this would come some arrangements and links, and I might begin to see how I could fit various ideas together. Tony Buzan would argue that this would be a more efficient way of proceeding than making lists or notes, and would be more likely to lead to original and creative thinking. By making mind maps I would allegedly get to understand how the various different strands of my thinking fitted together. At the end of this I would be in a position to know what the question was that I wanted to address. Did I, for example, want to answer the question “How are symbolic forms transmitted through history?”, or did I want to ask “Is the notion of symbolic forms flawed?”“*

<https://www.owenkelly.net/691/concept-maps-are-not-mind-maps/>

Mind map consists of keywords which are linked with each other. These keywords are related to the particular problem, a question, an application domain which we are interested in. During mind mapping, we use creative thinking. We can add colours, pictures, graphs, equations, etc. into our mind map according to what we are feel if we think about particular problem, question or an application domain. Mind map has “sun-like” structure. It means that one core keyword (concept) is identified and is in the centre of our mind map. Next keywords (concepts) are linked to the preceding keyword. Linked keywords have to correspond with each other. Mind map is the result of our subjective view on particular problem, a question or an application domain. Mind map has a tree structure that is a result of a brainstorming activity. More important keywords are larger in comparison to the less

important keywords. The following section depicts the most important facts about mind maps:

- **Purpose of their existence:**
  - Knowledge organisation and representation
  - One-page method, i. e. all important facts can be found on one page.
  - Used for facilitation the understanding of particular problem
  - Used for brainstorming
- **Structure:**
  - Key keywords (concepts) are written on the lines representing branches of the map.
  - Lines (relations between keywords) do not have names.
  - There is only one central keyword (concept) in the mind map.
  - More general keywords are closer to the centre of the mind map.
  - Graphical illustrations can be used for explanation of the keywords.
  - No multiple-inheritance, i. e. one keyword can have only one parental keyword
  - Structure is tree-based.
- **For whom?**
  - Personal and subjective map created by the author (human)

The following section of the seminar introduces the steps which are recommended for mind maps building (T. Buzan: The Mind Map Book (1991))

1. Start in the centre with an image of the topic, using at least 3 colours.
2. Use images, symbols, codes and dimensions throughout your Mind Map.
3. Select key words and print using upper or lower case letters.
4. Each word/image must be alone and sitting on its own line.
5. The lines must be connected, starting from the central image.
6. The central lines are thicker, organic and flowing, becoming thinner as they radiate out from the centre.
7. Make the lines the same length as the word/image.
8. Use colours “your own code” throughout the Mind Map.
9. Develop your own personal style of Mind Mapping. Use emphasis and show associations in your Mind Map.
10. Keep the Mind Map clear by using Radiant hierarchy, numerical order or outlines to embrace your branches.

You can find various repositories of mind maps e. g. in <http://www.tonybuzan.com/gallery/mind-maps/>. The following mind map visualises what the author imagines if he/she speaks about mind maps.



Source: <http://www.tonybuzan.com/gallery/mind-maps/>

We are going to use the mind maps for literature review – for the state of the art preparation. Mind map is going to visualises the central topic (keyword) which we are interested in, i. e. the problem that is going to be solved with the multi-agent systems. Central topic is going to be related to the next keywords which are going to represent similar research studies which also solve the same or similar problem as we solve. The fundamental facts about these research studies (journal articles, conference proceedings and papers, books, etc.) are going to be included in the mind map too. Our project mind map will cover actual research in the topic which we are interested in our projects in the aAUTS subject. Our mind maps will provide different look on the actual state of the topic, in comparison to the long texts which can also introduce what have been already done in the research area – in the multi-agent systems, of course.

We are going to use the CmapTools software (<https://cmap.ihmc.us/>) for mind maps modelling. The true is that CmapTools software is primarily used for drawing concepts maps, not for the mind maps. There is a difference between mind maps and concept maps, see the lecture 3. In case of mind maps, only one topic is in the centre of the whole structure. In case of concept maps, there is no central topic (idea) in the centre of the structure. The centre cannot be identified. The second main difference is the following. In case of concept maps, we create graph-based structure. In case of mind maps, we create hierarchy (tree-based structure). For our projects, we will create the mind map where our theme will be in the centre of our map. For our projects, we can create tree-based or graph-based structure. It means that in the view of the structure, our mind map can be tree-like or graph-like structure.

For learning how to create a mind map in the CmapTools, we will follow the instructions which are true for concept mapping! For our project, there will be only one difference. **In the project, we will have only one topic in the centre of our structure.** Everything else, what is mentioned in the below mentioned text, will be the same for our mind maps preparation.

## How to create the first concept map in the CmapTools?

We are going to build concept maps in the freely available software CmapTools during our seminars. You can freely download the software (<http://cmap.ihmc.us/products/>) – only registration is necessary. You can use the software also at school (main menu Start). Probably, you will have to use the virtual class room. You can select room nr. 21. Working with the CmapTools is very intuitive and easy. This part of the seminar presents the most important steps in building Cmaps.

1. **Run the CmapTools software.** You will see the following screen, see Fig. 7. If you have already created some Cmaps, you can see them under the title “Moje Cmapy” (in eng. “My Cmaps”). It is possible that the installed version will be in the Czech language. For this reason, the following screens are explained.

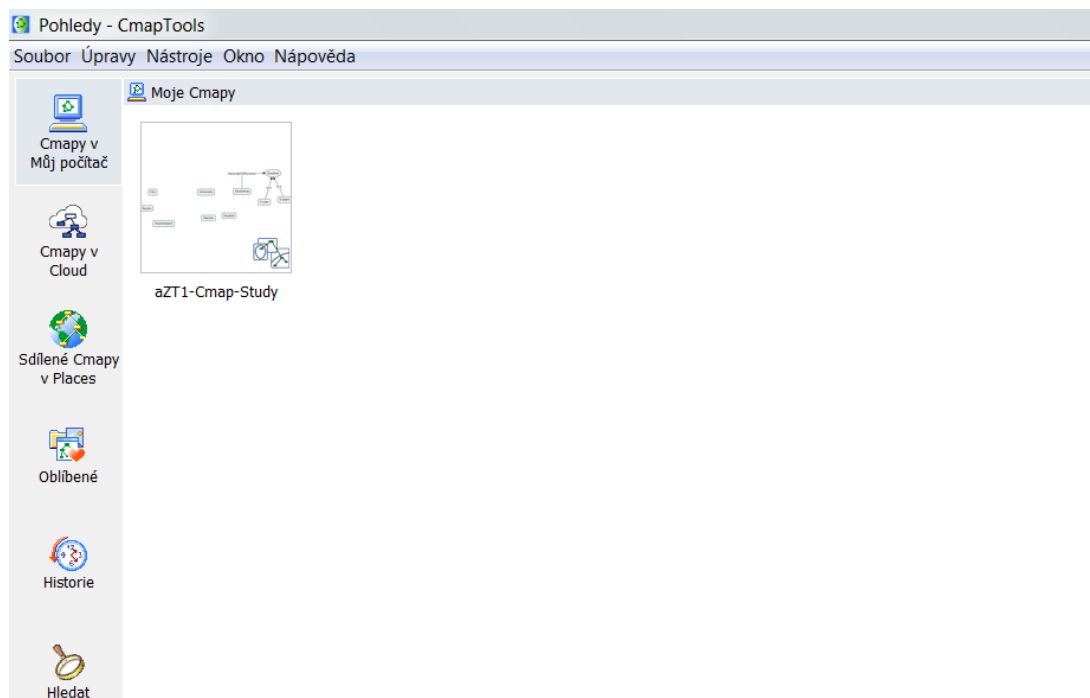


Fig. 7: The main screen of the CmapTools software

2. **Create the new Cmap.** Click on the item Soubor (File) and select the item Nová Cmapa (New Cmap). The new white screen (working place) will appear immediately, see Fig. 8.

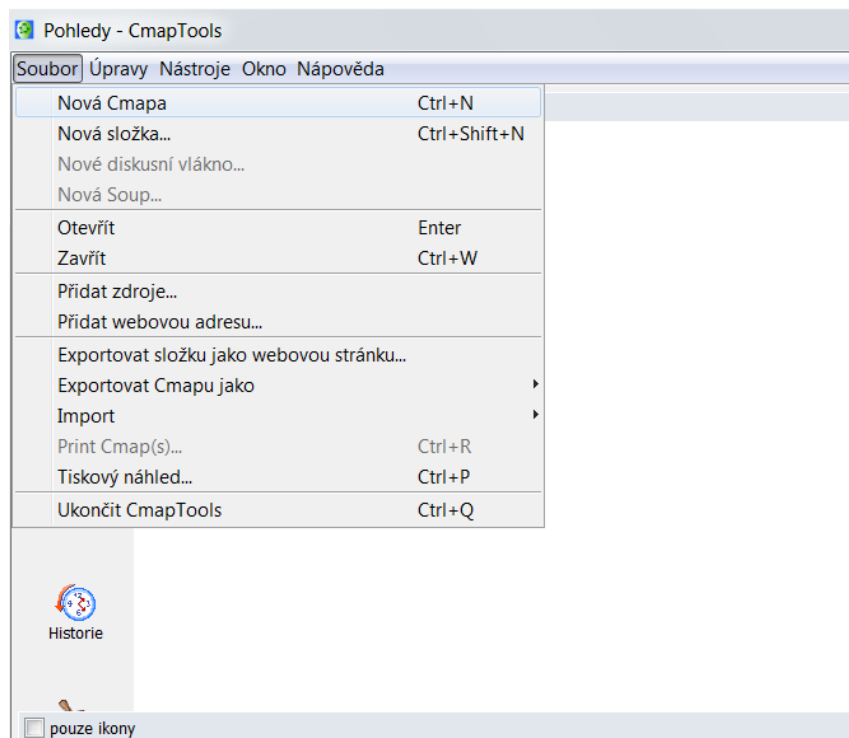


Fig. 8: The new Cmap in the CmapTools

3. **Build the new Cmap in the empty working space.** You will use this empty workplace for building the new Cmap, see Fig. 9.

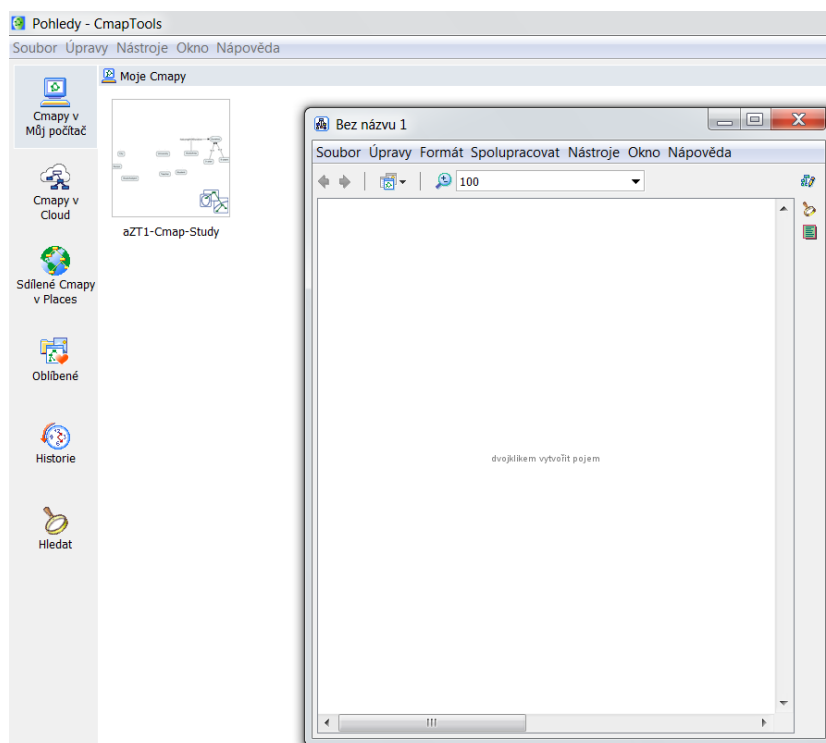


Fig. 9: Working place

- Create the new concept, e. g. *University* with double-clicking of the mouse on the workplace.

- You can change the visual style of the new concept: item Formát (Format)/Styly... (Styles), see Fig. 10.
- Create the second new concept, e. g. *Teacher* in the same way as the University.
- Create the relation between the above mentioned concepts called *teaches at*.
  - Click on the concept *Teacher* and you will see the icon with two arrows above this concept, see Fig. 11.
  - Click on this icon with two arrows and drag towards the concept *University*. You will see points for attaching the concept, see Fig. 12.
  - Give the name for the relation – *teaches at* (see Fig. 13).

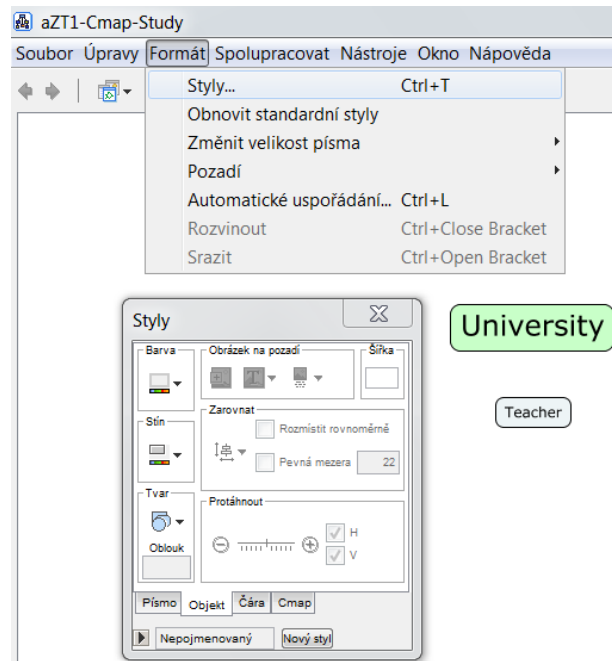


Fig. 10: Styles for concepts and relations in the CmapTools



Fig. 11: Relations between concepts in the CmapTools

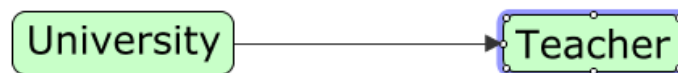


Fig. 12: Attaching points during relations specification

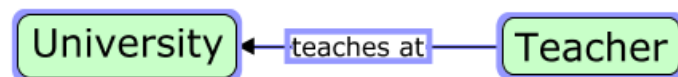


Fig. 13: The new relation – teaches at in the CmapTools

- Use the following conventions for Cmaps development:
  - The Cmap has to be well arranged (the links should not cross).
  - The Cmap should contain the most substantial concepts and linking words.

- Use the initial capital letter for concepts together with the shape for concepts, see Fig. 14.
- Use the small letter for linking words (relations between concepts).
- Use the arrows for linking words (relations between concepts).
- Use the oval shape for concepts indicating the property. (attribute) of concept (e. g. colour, duration, year of study, size, gender, etc.), see Fig. 14.

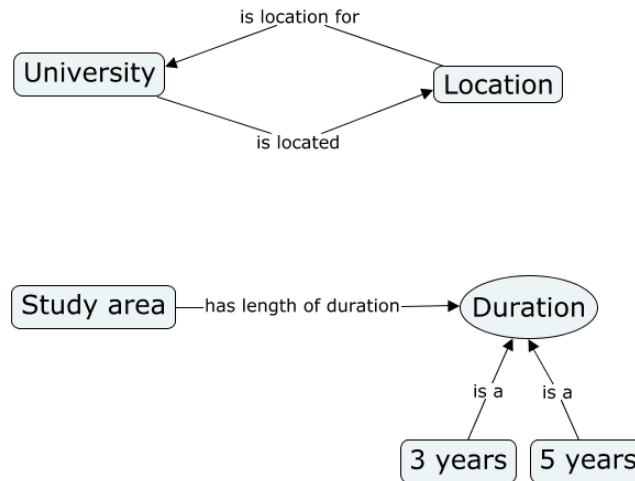


Fig. 14: Graphical conventions followed in seminars aZT1

4. **Save the map.** Select the item Soubor (File)/Uložit Cmap jako ... (Save the Cmap as ...), see Fig. 15. The new screen (form) appears, see Fig. 16. Fill the empty gaps that represent the metadata of your Cmap.
  - Název – Name for your Cmap,
  - Otázka zaměření – Focus of question,
  - Klíčová slova – Keywords,
  - Jazyk – Language,
  - Autoři – Authors of the Cmap,
  - Organizace – Organisation,
  - Email – Email.

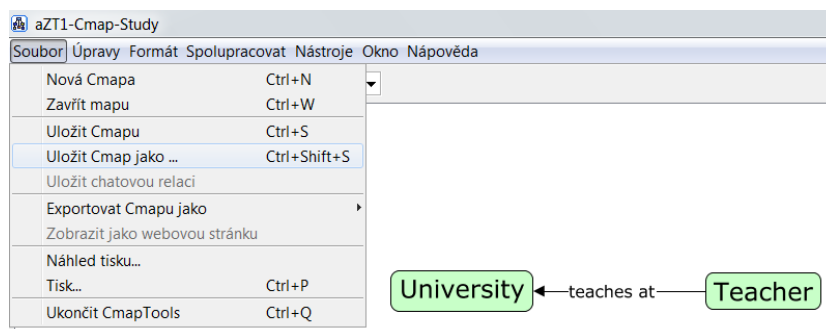


Fig. 15: Saving the Cmap

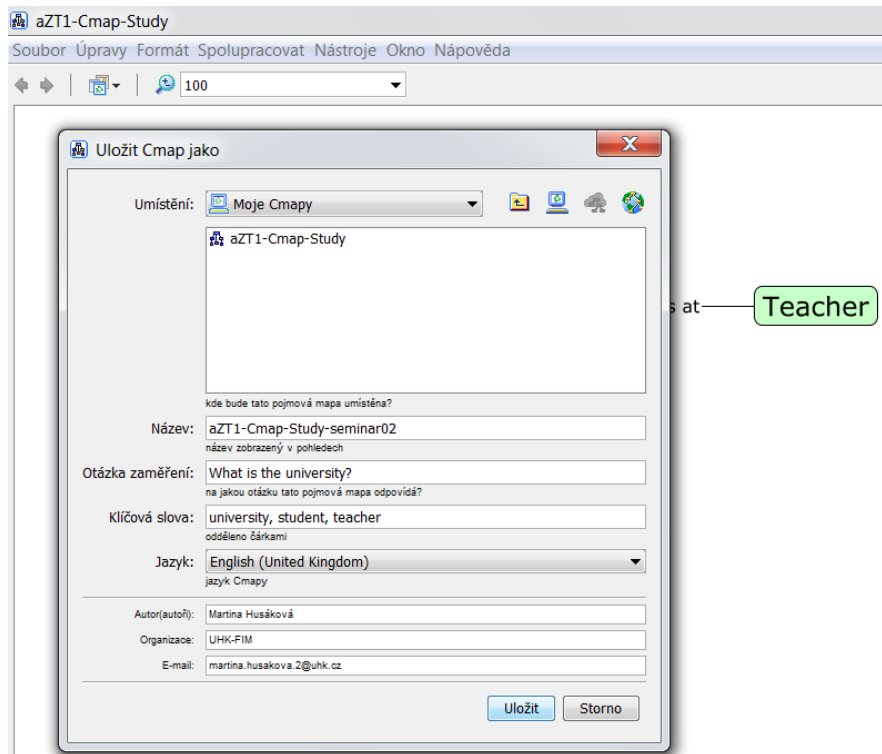


Fig. 16: Metadata for your Cmap

5. Exporting the Cmap: You can export the Cmap into the various formats, e. g. into jpeg, pdf, etc. Use the item Soubor (File)/Exportovat Cmapu jako ... (Export the Cmap as...)
6. **Where can I find my Cmap in the computer?**  
The most often location of your Cmaps is the following: the harddrive  
C:\Users\YourName\Documents\My Cmaps

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End of the seminar

## Exercises

- Try to design a mind map in the CmapTools where you introduce yourself.
- Prepare the mind map for your own project (Parameters of your mind map for your project are mentioned in the document named aAUTS-ProtocolForProject-2018.docx)
- Read the below mentioned materials, see References section.
- Read the document theoryunderlyingconceptmaps.pdf (ukazky, seminar 03)

## The most important keywords:

- Mind map
- Concept map
- CmapTools



## References

- <https://www.flickr.com/photos/philippeboukobza/8608133034/>
- <http://www.owenkelly.net/691/concept-maps-are-not-mind-maps/>
- [http://www.informationtamers.com/WikiT/index.php?title=Concept maps or mind maps%3F the choice](http://www.informationtamers.com/WikiT/index.php?title=Concept_maps_or_mind_maps%3F_the_choice)