To be or not to be ... structured?

Here is a brief summary of Raul Mäesalu’s master thesis: Complexity and Understandability Comparison of the Unstructured and Structured Business Process Models. I am focusing mainly on the experiment which is described in the second part of the thesis.

The result of the business consulting project is a process model/business processes. This is a very good basis for different discussions and organization development. How to make business processes more understandable and “readable“ for the ordinary business people? Raul Mäesalu analyses an interesting opportunity of the process improvement via better structure of the business processes.

The good structure of the diagram makes it more understandable for our reader. The reader has to recognize parallel and alternative tasks/paths in the process, to determine the start and end tasks on the diagram, etc. A good layout and smart use of the business process diagram notation gives a number of different opportunities to make the business process diagrams easily understandable.

In BPMN (Business Process Modeling Notation) split and join connectors are used to determine a precise path through the different tasks. Raul Mäesalu has focused on systematic/structured use of connectors in the business process diagrams in his master thesis:

Definition: A business process model is structured if every split connector matches a respective join connector of the same type.

Mäesalu used the program BPStruct for converting unstructured (connector point of view) processes to structured form and set two hypotheses:

- BP models restructured with BPStruct are less complex than the equivalent unstructured ones.
- BP models restructured with BPStruct are easier to comprehend than the equivalent unstructured ones.

Here is a sample of an unstructured and structured diagram:
It shows that the first (left) version of the diagram does not follow the definition of the structured diagram (there are split connectors without respective join connector). The other diagram (right) follows the definition, and I have to mention – alternative paths on the diagram are easy to recognize and follow.

Mäesalu organized a survey about the hypotheses. There were 8 different process models/diagrams used in the experiment and 4 questions (yes/no answer) about the processes were given. There was one more question about the perceived difficulty/complexity of the diagram on a 4-point scale. 18 master students were split into two groups: the first group had to analyze and answer the questions about the unstructured process diagrams, the second group answered the same questions but the structured version of processes structured with BPStruct. 30 seconds was given to answer a question. At the same time complexity (graph complexity taking into the consideration number of nodes, arcs, etc.) of diagrams was calculated.

This experiment disapproved both hypotheses!
- The first group valued perceived complexity ~15% lower than the second group …
- … and got 4-question score ~4% better than the second group.
- Finally – calculated complexity increased after converting processes to the structured format!

Where is the problem? We can find similar recommendations in different articles (for example, Seven Process Modeling Guidelines, Mendling, Reijers, Aalst) – you should model as structured as possible. I think the answer is in the second part of the last sentence: model as structured AS POSSIBLE.

Probably you have already noticed that sometimes duplicated tasks/nodes should be generated during the converting process. In our example nodes C and E were duplicated to follow the structured connector definition. Duplicated nodes increase the graph formal/calculated complexity and more nodes make it more difficult to comprehend and understand. Here is one more problem related with duplicated nodes – reader has to know/recognize that there are two (or even more) nodes/tasks on the diagram which are actually the same – it is a very complicated task to identify this fact.

Raul Mäesalu’s master thesis is very interesting. It proves that if our process models are used by (business) people, then they should be structured … but not over structured.