Diagram Size vs. Layout Flaws: Understanding Quality Factors of UML Diagrams - DTU Orbit (03/12/2018)


Context: Previously, we have defined the notion of diagram size and studied its impact on the understanding of UML diagrams. Subsequently, questions have been raised regarding the reliability and generality of our findings. Also, new questions arose regarding how the quality of diagrams could be defined, and how it interacts with diagram size. Goal: We pursue three goals. First, we want to increase the validity of our research by analyzing a substantially larger data set than before. Second, we broaden the generalizability of our results by including two more diagram types. Our main contribution, though, is our third goal of extending our analysis aspects of diagram quality. Method: We improve our definition of diagram size and add a (provisional) definition of diagram quality as the number of topographic layout flaws. We apply these metrics on 60 diagrams of the five most commonly used types of UML diagram. We carefully analyze the structure of our diagram samples to ensure representativeness. We correlate diagram size and layout quality with modeler performance data obtained in previous experiments. The data set is the largest of its kind (n=156). Results: We replicate earlier findings, and extend them to two new diagram types. We provide an improved definition of diagram size, and provide a definition of topographic layout quality, which is one more step towards a comprehensive definition of diagram quality as such. Both metrics are shown to be objectively applicable. We quantify the impact of diagram size and quality on diagram understanding. Conclusions: The overall results of previous studies are confirmed, while our previous recommendations for creating better diagrams are revised and refined.

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