Variability has become an important aspect of modern software-intensive products and systems. In order to reach new markets and utilize existing resources through reuse, it is necessary to have effective management of variants, configurations, and reusable functionality. The topic of this thesis is the construction of feature models that document and describe variability and commonality. The work aims to contribute to methods for creating feature models that are of high quality, suitable for their intended purpose, correct, and usable.

The thesis suggests an approach, complementing existing feature modeling methodologies, that contributes to arriving at a satisfactory modeling result. The approach is based on existing practices to raise quality from other research areas, and targets shortcomings in existing feature modeling methods. The requirements for such an approach were derived from an industrial survey and a case study in the automotive domain. The approach was refined and tested in a second case study in the mobile applications domain.

The main contributions of the thesis are a quality model for feature models, procedures for prioritizing and evaluating quality in feature models, and an initial set of empirically grounded development principles for reaching certain qualities in feature models.

The principal findings of the thesis are that feature models exhibit different qualities, depending on certain characteristics and properties of the model. Such properties can be identified, formalized, and influenced in order to guide development of feature models, and thereby promote certain quality factors of feature models.
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