THE IMPACT OF VARIBILITY ON SOFTWARE PRODUCT LINE ARCHITECTURE RECOVERY

This briefing reports evidence of an exploratory study on the recovery of software product line architectures investigating how the variability can affect the recovery process.

FINDINGS

- The variability identified on the Product Line Architecture (PLA) reduced the metrics values related to component reuse rate.
- As a result of the study, we identified that some PLAs did not provide variability in architectural level. In other words, all the Software Product Line (SPL) products have the same architecture. In these projects, the variability is implemented in low-level granularity and did not affect the PLA structure.
- The metrics implemented in the study tend to be more precise when we included more products in the comparison to recover the PLA.
- We identified a correlation between the metrics Structure Similarity Coefficient (SSC) and Component Reuse Rate (CRR). The higher the SSC value, the higher CRR values tends to be.
- We identified that projects with high values of CRR were the ones where the number of system classes outnumbered the features.
- Projects with no detected variability on architectural levels were also the one where the number of classes outnumbered the features.
- The study provided the PLA of 15 open source SPL projects extracted from different repositories.
- The T-Wise method can be used to improve the recovery process by using fewer products, this must be further investigated.
- Some PLA showed that some SPL projects could have bad code smells by analyzing the Design Structure Matrix (DSM).
- The DSM can be used to support the project for code smells identification and other code characteristics.
- Projects with the higher number of optional features were the ones with lower values of CRR.

Keywords:

Software Product Lines
Product Line Architectures
Variability
Product Line Architecture Recovery

Who is this briefing for?

Software engineering practitioners who want to make decisions about product line architecture recovery based on scientific evidence.

Where the findings come from?

All findings of this briefing were extracted from exploratory study conducted by Cardoso et. al.

To access other evidence briefings on software engineering:

http://www.lia.ufc.br/~cbsoft2017/programacao-sbcars/

For additional information about the study and to view the recovered PLA:

https://sites.google.com/view/sbcars2017-mpassos/home

For additional information about aSide @ UFBA - software design and evolution research group:

http://wiki.dcc.ufba.br/Aside/